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Outreach/Risk Reduction Strategies for Changing HIV-Related Risk Behaviors Among Injection Drug Users

The National AIDS Demonstration Research
(NADR) Project

National Institutes of Health

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FOREWORD

The National AIDS Demonstration Research (NADR) Project was initiated in 1987 by the Community Research Branch of the National Institute on Drug Abuse (CRB/NIDA) to direct community-based AIDS prevention research programs to out-of-treatment injection drug users (IDUs) and their sexual partners.

A specific dimension of the NADR project was the use of street outreach to deliver prevention services to IDUs and to facilitate recruitment of hard-to-reach populations into acquired immunodeficiency syndrome (AIDS)-related education and counseling sessions. Under NADR, tens of thousands of clients were educated about AIDS and associated risk behaviors. An important feature was the concomitant sponsorship of research activities to evaluate changes in high-risk behaviors following participation in these sessions. This monograph describes a series of analyses evaluating the effects of the NADR outreach projects. Results are reported for 28 sites that delivered outreach services and collected baseline and followup reports of risky behaviors.

These projects demonstrate an overall effectiveness regarding change of human immunodeficiency virus (HIV)-related risk behaviors among IDUs and their sexual partners as measured by a pretest/posttest design. Results reveal both statistically significant and clinically meaningful decreases in HIV-related risk behaviors, including frequency of injecting drugs, use of noninjected drugs, use of borrowed injection equipment, and number of sexual partners. Significant increases were observed in use of new needles, use of bleach to clean injection equipment between uses, and use of condoms. Among sexual partners of IDUs, significant reductions were observed in use of non injected drugs and number of sexual partners. Sexual partners increased their use of condoms as well. These changes are some of the most noteworthy ever reported in the drug abuse literature.

It would be difficult to overemphasize the findings of the NADR demonstration programs. Implementation and evaluation of the program has established an essential foundation of knowledge and experience required for the development of practical, effective, and efficient public health models. The strategies within this foundation need to be implemented as part of our public health response to AIDS.

EXECUTIVE SUMMARY

The National AIDS Demonstration Research Project was initiated by the Community Research Branch of the National Institute on Drug Abuse in 1987. This report is based on data from 28 NADR sites that contributed longitudinal data to the NADR database on the human immunodeficiency virus (HIV)-related risk behavior among 13,475 injection drug users and 1,637 sexual partners of IDUs who were followed for a period of 6 months. The NADR project's three primary objectives were to: 1) accurately characterize the HIV-relevant behaviors of IDUs not in drug treatment and of their sex partners; 2) reduce the risk of HIV infection among IDUs and their sex partners; and 3) develop, implement, and evaluate education/intervention strategies for reducing the risk of HIV infection and transmission among IDUs and their sex partners. In accordance with NIDA guidelines, and in the context of a quasi-experimental program evaluation design, investigators at these 28 sites collected baseline and 6-month followup measures of risk for HIV infection among eligible subjects. Eligibility requirements specified that subjects must have either injected drugs in the last 6 months (to be included as an IDU) or had sex with someone who had injected drugs (to be included as a sex partner of an IDU). Drug injectors who had been in drug treatment within the last 30 days were not eligible for the study.

Researchers employed a community outreach intervention model to enlist subjects for the study. Outreach workers, often former IDUs themselves, initiated contact with potential subjects in a wide range of community settings, including neighborhoods and areas known for the selling and/or using of injection drugs. Eligible subjects were directed or escorted to the interview location, often housed in a storefront or community health center. Following a risk assessment interview conducted by a trained NADR staff member, each subject attended an education/intervention session conducted by a health educator or community health outreach worker. This session was designed to provide information about HIV infection and effective strategies for reducing the risk of HIV infection. As part of a quasi-experimental evaluation design, subjects at some sites were assigned to one of two intervention modalities, typically characterized as a short, standard intervention and a longer, multisession enhanced intervention. At most sites, HIV testing and pretest and posttest counseling were available. (Testing was not mandatory for participation in the study.)

The use of standardized baseline and followup assessment instruments (AIDS Initial Assessment or AIA, and AIDS Follow-Up Assessment or AFA) ensured comparable data were collected across all sites. In addition, test-retest reliability studies of the instruments minimized measurement error in the data. The assessment obtained demographic and background information, detailed drug use history, current drug use including needle use practices, and current sexual behavior profile for each subject. Separate, parallel analyses were conducted for IDUs and for sex partners of IDUs.

Comparison of AIA and AFA data for IDUs revealed significant decreases in HIV-related risk behaviors following the interventions, including the frequency of injecting drugs, the use of noninjected drugs, the use of borrowed injection equipment, and the number of sex partners reported by the subject. Significant increases were observed in the use of new (rather than previously used) needles, the use of bleach to clean injection equipment between uses, and the use of condoms. Among sex partners of IDUs, significant reductions were observed in the use of non injected drugs and the number of sex partners. Sexual partners significantly increased their use of condoms as well. The magnitude of behavioral change varied with the specific behavior as well as for different segments of the sample. In particular, changes in risky needle-related behaviors of IDUs were more dramatic than the changes in their risky sexual behaviors.

An important part of the analysis was the evaluation of the intervention modalities in terms of their effect upon the level of HIV-related risk behaviors among IDUs and their sex partners. Comparisons of the standard (short, typically one session) intervention with the enhanced (longer, multisession) intervention revealed slightly greater reductions of risk among those subjects who received the enhanced intervention. However, this difference was not uniform across all sites and was at least partly a function of the site-specific duration, format, and content of the enhanced interventions. Further analysis revealed that several specific components of the enhanced intervention appear to have had significant and fairly generalizable consequences in terms of risk reduction. In particular, these components included providing subjects with condoms and/or bleach (for cleaning injection equipment) and demonstrating the proper use of condoms and bleach.

Other factors linked to level of risk were identified in a series of analysis of covariance (ANCOVA) models. At followup, Hispanic IDUs, those who were unemployed, those who had previously been in drug treatment, those whose primary injection drug was heroin, and those who had longer histories of drug injection reported lesser reductions in the use of injected drugs than did other IDUs. At followup, overall needle-related risk was reduced most significantly among black IDUs. Overall sexual risk at followup was lowest among males and nonwhite IDUs.

INTRODUCTION

The National AIDS Demonstration Research (NADR) Project was initiated in 1987 to direct community-based prevention projects to out-of-treatment injection drug users and their sexual partners. Under NADR, the National Institute on Drug Abuse funded and received quality-controlled data from 28 grant-supported sites which delivered outreach services and collected baseline and followup reports of risky behaviors. A specific dimension of the NADR project was the use of street outreach to deliver prevention services to injection drug users and to facilitate recruitment of hard-to-reach populations into AIDS-related education and counseling sessions. Another important feature was the concomitant sponsorship of research activities to evaluate changes in high-risk behaviors following participation in these sessions.

This publication describes a series of analyses evaluating the effects of the NADR outreach programs. The NADR project is described in detail, followed by a series of analyses on the IDU and sexual partner NADR database. Relevant methodological issues are discussed, followed by a discussion of implications of the findings.

Background: Early Efforts to Reach Populations at Risk for HIV Infection

The early response to the AIDS epidemic emphasized the marshaling of resources and the implementation of prevention programs, with few efforts aimed at research and evaluation of interventions. Many communities responded by launching educational campaigns against human immunodeficiency virus (HIV) transmission. A review of the earliest education projects directed to IDUs indicates that most projects were concerned exclusively with information dissemination (Schuster 1988). Similarly, the mass media reported scores of AIDS stories and, in early stages of the epidemic, many IDUs came to high levels of awareness about the dangers of viral transmission through shared drug injection equipment (Friedman et al. 1986).

Early reports indicated that some IDUs translated their enhanced awareness into positive behavior change. For example, interviews of IDUs in and out of drug treatment in New York City between 1983 and 1987 suggest that large numbers of IDUs were either seeking sterile injection equipment, reducing their numbers of needle-sharing partners, reducing the injection of drugs, or ceasing injection of drugs altogether (Des Jarlais et al. 1985; Selwyn et al. 1987; Des Jarlais et al. 1989). Similar interviews with IDUs in and out of treatment in London (Power et al. 1988) and Edinburgh (Robertson et al. 1988) found decreases in needle sharing and/or injection following the British government's campaign to heighten awareness about AIDS. Nonetheless, many IDUs continued to share their injection equipment and thus remained at risk of infection (Ginzburg et al. 1986; Selwyn et al. 1987; Power et al. 1988).

The inaction by many IDUs to substantially change risky behaviors is not surprising, since the wealth of established health behavior theory and research indicates that the presentation of factual information is a necessary, but insufficient mechanism for fostering and maintaining behavioral change (Emmons et al. 1986; Becker and Joseph 1988). Rather, individuals generally become motivated to change their unhealthy behaviors if they perceive their own vulnerability to serious risk and their ability to protect themselves (Sutton 1982; Janz and Becker 1984). To instill such a sense of self-efficacy, it is important for interventions to demonstrate how desirable behaviors are practiced and for individuals to practice these behaviors themselves (Bandura 1977).

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There is a tendency to assume that IDUs are more resistant than other individuals to behavioral change. However, research has demonstrated that the principles governing self-efficacy apply equally to IDUs as well as non-IDUs. While the value of information alone is limited (McAuliffe 1988; Nyanjom et al. 1988; Des Jarlais et al. 1990) and demonstrations of technical and interpersonal skills may facilitate some reductions in risky behavior (Rhodes et al. 1992), researchers suggest that additional factors are critical in inducing change in this population. For example, motivation for change is apparently enhanced when risk reduction messages and behaviors are reinforced and made culturally relevant (Friedman et al. 1986; Friedman et al. 1990), and when behaviors become culturally shared among the targeted subpopulation (Friedman et al. 1987). Intervention programs directed to IDUs also appear successful when they concentrate efforts at the community level and are delivered by people who have credibility with and access to the target group (Wiebel and Levin 1992). Because resources are rather limited in much of the drug-injecting population, material support (such as the provision of condoms and bleach) is also apparently important to induce change (Rhodes et al. 1992).

Increasingly, observational studies are supporting the hypothesis that IDUs are willing to modify their behavior to reduce their risk of acquiring HIV when information is delivered by a credible source, when information is culturally relevant and reinforced, when skills training is provided, and/or when material resources are provided. For example, a study in Cleveland, Ohio, demonstrated significant reductions in needle-related risk behaviors among IDUs 3 months after participating in a 1-hour AIDS education program (Stephens et al. 1991). Similarly, results from an early San Francisco community outreach project that distributed small bottles of bleach indicated that many IDUs adopted the use of bleach to sterilize their injection equipment (Moss and Chaisson 1988). Investigators have also reported postintervention reductions in sexual risk behaviors of IDUs, such as unprotected intercourse, casual partnering, or prostitution (van den Hoek et al. 1990), but these reductions are of a lesser magnitude than changes made in injection risk behaviors (Donoghoe et al. 1989).

The Scope of the NADR Programs

By the mid-1980's, the spread of AIDS among injection drug users and the sex partners and children of IDUs had posed new challenges to those involved in the delivery of health and social services and to those engaged in research in the fields of drug abuse and public health. The crisis called for a broad array of basic and applied research efforts, as well as innovative strategies for reaching often elusive populations and motivating them to change their drug use and sexual practices that place them and others at risk for HIV infection and related illnesses.

In response to this crisis, during 1987 and 1988, the National Institute on Drug Abuse, through grant and contract programs, developed 41 AIDS community outreach and intervention programs at 63 sites. While many of the programs were located in the northeastern part of the United States, all regions of the country were represented. These programs were targeted at men and women at high risk for HIV infection because of their use of injection drugs or frequent unprotected sexual activities.

The programs were of two types. Twenty-nine NADR grants were comprehensive community programs targeting both out-of-treatment IDUs and sexual partners of IDUs recruited from a variety of community settings (see exhibit A). Twelve AIDS targeted outreach model (ATOM) programs were directed efforts: 1) focusing on a particular community setting where at-risk populations could be found, e.g., criminal justice system housing authority programs, and emergency room admissions; 2) using specific community outreach methods, e.g., indigenous outreach workers, drug treatment center-based outreach workers; or 3) focusing on a particular target group, e.g., sexual partners of IDUs or pregnant drug users. (Results for the ATOM sites are not reviewed in this report and one grantee site had to be eliminated from these data analyses.)

All NADR programs offered a mix of services and research. The services were designed to provide impetus to behavioral change either through encouragement to enter drug abuse treatment or through innovative behavior change strategies developed by program staff and designed to meet the particular needs and concerns of the target population. The research component was carefully designed to describe the characteristics and behaviors not only of IDUs outside of treatment but also of those at risk for HIV infection by virtue of their intimacy with IDUs. Study of their peer relationships; contacts with health care, social service, and criminal justice agencies; needle and drug use behaviors; and sexual practices were essential to the development of program and policy initiatives in response to the AIDS epidemic. A knowledge of prevention strategies that could decrease the spread of disease within communities was of obvious significance.

The NADR project was administered by NIDA's Community Research Branch and was initiated in 1987.

METHODS

Project Objectives

The intervention demonstration research projects, known collectively as the National AIDS Demonstration Research Project, were instituted to combine strategies for slowing the spread of HIV infection with a research program to clarify the efficacy of different outreach/intervention initiatives for different populations. Outreach efforts were targeted to IDUs not in treatment and the male and female sex partners of IDUs. Typically, these initiatives relied upon an outreach staff to locate individuals at high risk who might otherwise be overlooked in prevention efforts, especially IDUs who were not in contact with the drug abuse treatment system or other traditional service delivery systems. In addition, outreach staff were responsible for reaching women who did not know or had not acknowledged that their sex partners were IDUs, and had in this way threatened themselves and their unborn children with HIV infection. By bringing innovative and culturally appropriate preventative interventions into the community, these programs created the potential for modifying unsafe drug use and sex practices that placed the individual and the community at risk.

Criteria for Study Participation

Most participants were initially contacted and screened by community outreach workers. Outreach initiatives differed for specific populations. When the target population was out-of-treatment IDUs, outreach programs emphasized both community and institutional settings. Most commonly, emphasis was placed on providing outreach to "copping areas"; that is, open-air markets within the community where illicit drugs are bought and sold. Copping areas are parts of the community where IDUs gather at regular and reasonably predictable times and, thus, represent locations appropriate for intervention efforts. IDUs were also recruited from within institutional settings, including the criminal-justice system and hospital emergency rooms.

Sex partners of IDUs were typically recruited in a variety of community settings as well. These included street settings through the use of mobile health screening vans, on-site outreach in public housing authority programs, and community settings frequented by women, such as launderettes and beauty parlors located in neighborhoods with high levels of drug use. Sex partners of IDUs were also recruited from institutional settings, including health care facilities such as obstetrical/gynecological clinics, well-baby clinics, and sexually transmitted disease (STD) clinics, and other public health facilities and social service programs, such as homeless and/or battered women's shelters and financial support programs.

To meet national eligibility criteria, participants must have:

1. injected drugs in the past 6 months

or 2. had sexual relations with an IDU within the past 6 months.

In addition, participants:

3. must not have been enrolled in a drug treatment program during the past 30 days

and 4. must have been within the age group specified by NIDA (18 years of age or older in programs funded in 1987, and 13 years of age or older in programs funded in 1988).

All respondents who met the first requirement were classified as IDUs; all other participants were categorized as sex partners.

Outreach Workers

Individuals hired to perform outreach services generally shared a common background and set of experiences with the populations they were attempting to recruit. By typically hiring recovering injection drug users to serve as outreach workers, projects employed credible agents for change, since the outreach workers had lived and weathered the life of addiction and made the lifestyle changes being suggested.

Research Design

The evaluation research design involved three key elements. First, as part of the research intake process, all clients completed the AIDS Initial Assessment (AIA), a structured, primarily closed-ended interview schedule designed to collect demographic and background information, drug use history and patterns of current use, needle-using behaviors, sexual activity and behavior, and disease information (particularly STDs), including whether the respondent had ever been tested for HIV. Information obtained from the AIA provided descriptive information regarding the characteristics of out-of-treatment IDUs and sex partners of IDUs as well as baseline data regarding risk-taking behaviors prior to receiving a preventative intervention. All interviewers received standardized training in administering the AIA. The AIA, which took between 25 and 60 minutes to administer, was conducted under a federally assured certificate of confidentiality in a face-to-face setting to ensure appropriate privacy. Along with the AIA, locator data to be used for followup were also collected, including names, addresses, and telephone numbers of persons likely to remain knowledgeable about the client's whereabouts. Immediately after the AIA, many sites offered clients HIV counseling and testing. While testing was not required to receive the preventative intervention, clients were encouraged to learn their serostatus.

The second key element in the typical program, after the interview and HIV counseling and testing, was the assignment of clients, by design, to either a standard or an enhanced intervention. In all but a few sites, clients were assigned either randomly or through systematic sampling, e.g., assigning every nth client to the enhanced intervention. In those sites in which the intervention called for involving all injection drug users within a neighborhood social network, all clients recruited were assigned to the enhanced intervention. The standard intervention usually comprised an AIDS education session with referral for needed community services. The enhanced interventions involved a didactic session but included any of several additional initiatives as well. Those additional initiatives included:

- Individual and group counseling in which individuals were encouraged to change current behaviors and adopt alternatives to those behaviors.
- Couples counseling in which IDUs and their sex partners were jointly aided in understanding risks and exploring alternative behaviors.
- Cognitive skills training in which at-risk individuals were aided in exploring means-ends relationships and consequences as related to their own behaviors and developing and testing alternatives. Frequently, cognitive skills building was conducted after efforts were made to include participants' greater awareness and concern about their own vulnerability.
- Development of peer networks that supported participants' efforts to reduce risk of HIV infection through encouragement and, as appropriate, confrontation.
- Social skills training in which sex partners, in particular, were assisted in exploring and testing strategies for asserting their own needs and for modifying the behaviors of others who placed them at risk for HIV infection.

Third, approximately 6 months after the AIA interview, using information from the locator form, clients exposed to either standard or enhanced interventions were recontacted, and the AIDS Follow-Up Assessment interview schedule was administered. This interview schedule was designed to obtain information about risk-taking behaviors regarding drug use, needle use, and sexual activity that reflected changes from baseline (i.e., from the AIA). Measures of knowledge about AIDS were also obtained. As with the AIA, all interviewers received standardized training from the National Data Coordination and Evaluation Center (NDC&E) (described below). The AFA interview required between 20 and 55 minutes to administer. At the end of the interview, clients at most sites were again offered an opportunity for HIV counseling and testing. Baseline and followup instruments were developed collaboratively with project staff and other experts in the field. Interview data were supplemented locally both by HIV test results and by qualitative and quantitative ethnographic and program process data.

National Data Coordination and Collection

To permit effective and efficient national data collection, monitoring, and analysis of aggregated field information (baseline and followup interviews, HIV test results, and a small subset of process data), NIDA established a National Data Coordination and Evaluation Center in September 1987. As NIDA's NDC&E center contractor, NOVA Research Company was responsible for collecting and processing all interview data from field program sites for the two key survey instruments (AIA and AFA questionnaires), as well as from other program instruments and activities such as the subjects' contact forms, HIV antibody testing results, and subject lost-to-followup forms. Data screening and quality assurance were performed on microcomputers. The data were then aggregated at the ADAMHA Parklawn Computer Center by NOVA Research Company staff. Quality assurance analysis was performed on a 15 percent random sample of all AIA, HIV, and AFA cases submitted for inclusion in the national database.

NOVA also coordinated a test-retest reliability analysis for the AIDS Initial Assessment questionnaire initiated in the spring of 1989. During the summer months, nine NADR grantees assembled a total of 239 sets of interviews for a test-retest study. Forty-three of these pairs were excluded from study because either the second interview was not within the specified range of 2 to 14 days after the initial interview or the respondent did not meet national eligibility rules. Thus, 196 interview pairs provided usable information for the reliability analysis. Of the 196 subjects, 95 percent were injection drug users; 72 percent were male; 43 percent were white; 35 percent were Hispanic; 19 percent were black; and 3 percent were of another race/ethnicity.

Test-retest reliability for each AIA variable was assessed by using one or more of these measures: percent observed agreement; kappa (observed agreement adjusted for chance agreement); and Pearson correlation coefficient.

Demographic variables as a group were reported with acceptable reliability. Of particular importance in this group of variables were the major classification variables: gender (100 percent observed agreement), race/ethnicity (95 percent observed agreement), and date of birth (98 percent observed agreement) for calculating the respondent's age. Education, major source of income, living place, and previous enrollment in formal drug treatment were all reported reliably.

In the drug use section, variables concerning early alcohol and drug use were reliably reported, as were variables concerning whether the respondent had ever used specific drugs. Reliable reporting was noted for frequency of injecting heroin, cocaine, and speedball, the three most prominent injection drugs. Even though injection of amphetamines was indicated by a relatively small number of IDUs, the frequency of injection in the past 6 months was reported with acceptable reliability. Frequency over the past 6 months of use of several noninjection drugs was not reliably reported. Exceptions to this were frequency of the use of alcohol and marijuana, which were considered reliable. Similarly, the analysis revealed mixed reliability results for some individual variables concerning needle use and sexual behavior. (The broader implications of the reliability of self-reported behavior are discussed in detail in the results section.)

Measuring the Overall Risk for HIV: Constructing Behavioral Risk Scales

It is undoubtedly important to determine how risk-taking behavior relates to HIV seropositivity so that elements of particular risk can be determined. In the absence of serostatus linkable to risk-taking behaviors, it is convenient to have overall measures of risk which summarize groups of risk variables into indices or scales. Three summary scales of needle risk behavior, sex risk behaviors, and total frequency of drug injection were developed for this study in February 1990.

The construction of the scale for needle-related risk incorporated questions from the AIA/AFA related to three primary aspects of needle use: 1) the number of persons with whom the respondent shared needles; 2) injection with needles that had been used by other persons; and 3) the use of new or bleach-cleaned needles. The assignment of values to each of the variables and the computation of index scores are described in exhibit B.

Before constructing the index for sex risk, a set of intermediate variables were derived from the AIA/AFA. These variables assessed the following behaviors: the number of IDU partners; the type of sex practiced (vaginal, oral, and anal); whether a particular sex act was insertive or receptive; and whether condoms were always, sometimes, or never used. Risk scores were assigned to the various sexual behaviors based largely upon a review of the literature. In general, the highest risk score was assigned to anal sex; second highest to vaginal sex; and lowest score to oral sex. Higher risk scores were assigned to receptive rather than insertive sex. Increasing risk scores were given as the number of IDU sexual partners increased from none, to one, to more than one. The scores assigned to each sexual behavior and the general construction of the sex risk index are described in exhibit B.

The third dimension of risk behavior measured by a composite scale is the frequency of injection. The AIA contains a battery of questions about the frequency of injecting any of a long list of drugs. A composite scale was computed from this battery of questions to yield a single measure of the injection frequency of the IDU over the last 6 months. Together with the needle risk and sex risk scales described above, this injection frequency score is used as a primary behavioral outcome measure in the analyses described in the results section.

While some of the variables comprising the overall risk scales achieved only modest test-retest reliability, the three composite scales typically obtained acceptable reliability scores. For example, satisfactory reliability estimates were obtained for the needle and sex risk indices. A Pearson correlation coefficient of 0.69 was obtained for the needle risk index and coefficients of 0.76 and 0.84 were obtained for the sex risk index for males and females, respectively. (Pearson correlations of 0.70 or greater are judged to represent good to excellent reliability.) While these scales are conceptually appealing and methodologically parsimonious, it is frequently useful to examine specific risk behaviors such as cleaning needles with bleach or using condoms. Thus, results from the analyses described below employ both composite scales and individual risk behavior variables in assessing the impact of the intervention upon behavior.

The goals of analysis of the NADR national database presented below are to describe salient characteristics of the target population, assess changes in risk behavior by comparing data from the AIA and the AFA, and evaluate the impact of the NADR intervention/education programs that were implemented at the sites. The results are presented in four sections. First, findings regarding the risk behaviors of IDUs are presented. Second, data on risk behaviors of sex partners are presented. A third results section reviews findings regarding knowledge of AIDS among IDUs and sex partners. Finally, a fourth section reviews results from several analyses designed to address certain methodological issues pertaining to the data.

RESULTS

I. Risk Behavior Assessment of IDUs

Characteristics of the IDU Sample

For analysis of IDUs, 28 sites contributed information to the final analytical database as of January 1992. The sociodemographic and background characteristics of the 28-site IDU sample are presented in table 1. The sample averaged 35 years in age, was 26 percent female, and included 51 percent blacks, 25 percent Hispanics, and 22 percent whites. Under half were high school graduates, 55 percent were unemployed, and 81 percent had spent time in jail or prison. On average, respondents had been injecting for 14 years, and 41 percent had never been in a treatment program. With regard to sexual activities, respondents reported an average of 12 different sex partners in the past 6 months. Results from specific sites varied considerably on many of these traits.

Changes From Baseline to Followup

Baseline and followup assessment of selected risk behaviors are shown in table 2. The results for most variables indicate reductions in risk behavior at the 6-month followup for IDUs from all sites. Reductions were greater for needle risk than for the sex risk variables examined. Of the total sample, 54 percent indicated at the AIA that they had shared needles with two or more different persons during the preceding 6 months; at AFA, the percentage had dropped to only 23 percent. Also at the AFA, substantially fewer IDUs reported borrowing needles (24 percent, compared with 48 percent at AIA). A modest decrease was achieved in the percentage of IDUs who reported having two or more sex partners during the 6 months prior to assessment (36 percent at AFA, compared with 44 percent at AIA). In addition, regular use of condoms remained the exception: the proportion of IDUs who always used condoms increased from 10 to 19 percent.

The initial to followup changes in the percentage of IDUs reporting daily use of various drugs are presented in table 3. Once again, there was considerable reduction for all drugs examined. In general, the percent reporting daily use of a given drug was typically reduced by half from AIA to AFA.

The percentage of IDUs who reported daily injection use of cocaine decreased from 29 percent at the AIA to 14 percent at the AFA. The percentage who reported daily injection of heroin and speedball also declined, from 45 to 24 percent and from 29 to 16 percent, respectively. Though levels of noninjection use at AIA were already low, these also decreased substantially from AIA to AFA. This suggests that overall drug use declined, and decreased injection drug use was not merely supplanted by a non injection drug habit.

An additional, and unexpected, finding was that a substantial minority of injection drug users found their way into treatment consequent to receiving outreach/intervention services-many entering treatment for the first time in their lives. Overall, 33 percent of IDUs entered treatment during the 6-month followup and an additional 6 percent sought, but were unable to access, drug treatment. Most strikingly, 25 percent of IDUs who had never before involved themselves in drug abuse treatment entered drug abuse treatment during the followup period, and an additional 5 percent sought, but were unable to locate, treatment services.

Comparisons Between Standard and Enhanced Interventions

The number of IDUs assigned to the standard and enhanced interventions at the 20 NADR sites that contributed intervention-specific data, along with followup rates for each site, are shown in table 4. Of the 8,485 IDUs at these 20 sites, 3,932 were assigned to standard groups and 4,553 were assigned to enhanced groups.

Findings for the three primary outcome scales—injection drug use frequency index, needle risk index, and sex risk index—are shown in tables 5, 6, and 7. In each table, the percents at "high risk" (as defined in each table) at AIA and at AFA are presented, along with the percent of the sample for whom the risk index scores from intake to followup either decreased from intake to followup or remained at low levels (i.e., percent success). In the right margin, percent success and mean index scores on the outcome measures for standard and enhanced groups are also reported.

Seventy percent of the total sample reported daily injection drug use for the 6 months before AIA; this dropped to 42 percent in the 6 months following intervention, as shown in table 5. Overall, 50 percent of the sample reported reducing or maintaining low injection drug use frequency over time IDUs assigned to the enhanced intervention were more likely than those in the standard intervention to report reduced or continued low frequency of injection. The mean AFA score for injection frequency for IDUs in the enhanced intervention was significantly lower than the mean score for IDUs assigned to the standard intervention.

Results for needle risk are summarized in table 6. Sixty-two percent of the total sample reported high risk scores (i.e., scores of 4 or 5 on a scale ranging from 0 to 5) at baseline, compared with 31 percent at followup; 57 percent were successful in reducing needle risk or maintaining low levels at AIA to followup. Higher success rates were obtained for IDUs in the enhanced interventions. In addition, for the total sample, the mean AFA index score for IDUs in the enhanced intervention was significantly lower than the mean score for IDUs in the standard intervention.

Scores on the sex risk scale are summarized in table 7. Overall, 16 percent of the total sample reported high scores (with high scores defined as 6 or more on a scale ranging from 0 to 21) at baseline, compared with 8 percent at followup, and 73 percent were regarded as having either reduced risk or maintained low levels of risk. For the total sample, a small but significant difference in mean scale scores was found between the standard and enhanced groups.

In general, the data in tables 5, 6, and 7 show large reductions in risk among IDUs across all 20 sites. The combined analysis of all sites suggests that enhanced groups outperformed standard groups at a statistically significant level. That the advantage appears slight is a not altogether surprising result, given that the intervention group is treated merely as a dichotomy: there are sizeable cross-site differences in time and instructional content within the two classes of intervention. For example, standard interventions at some sites appeared to be more intensive than the enhanced intervention used at other sites. Furthermore, many sites reported poor compliance in attending interventions as scheduled, especially the multiple sessions often prescribed for the enhanced groups. In addition, sample size varied widely (ranging from 23 in one site to 1,577 at the other extreme), leading to unequal representation of sites in the total sample analyses. Furthermore, sociodemographic characteristics and backgrounds of participants which varied widely across sites may be very important determinants for outcomes. The next stage of analysis attempts to address several of these issues.

Analysis of Intervention Exposure Time and Participant Characteristics

In order to sharpen the analytical focus on the NADR intervention process, several measurement and sampling refinements were necessary. First, it was important to have a bAIAnced sample design in terms of comparable numbers of cases from each site and number of participants from each intervention group. Inspection of table 4 (presented earlier) indicates that nine sites included samples of 400 cases or more, each with approximately even numbers of standard and enhanced assignments. In addition, these sites provide a good geographic representation as well as an adequate diversity of participant characteristics (see table 1), allowing analyses on subgroups, such as those defined by race-ethnic status and drug use patterns. These nine sites were selected as the basis for the next stage of analysis. The two largest samples were reduced by random sampling to 513 cases each (representing the median size of the other seven sites) thereby resulting in a final sample size of 4,569.

The second refinement was to the "intervention classification" that was the basis of the analyses in tables 5, 6, and 7. The number of sessions attended by each participant and the duration of each session (in minutes) were used to compute a measure of "exposure time." The distribution of this measure for the nine sites is shown in table 8. As expected, enhanced interventions usually involved longer exposure than standard interventions at most sites. The measure reflects quantitative differences that occur across sites within each intervention classification and, thus, provides a more meaningful analytic measure than simple "standard versus enhanced" categorizations.

The relationship of followup outcomes to exposure time was examined using analysis of variance. Significant main effects for exposure time were found for each of the three primary outcome measures. Inspection of the mean scores revealed that there was a general tendency for highest levels of risk among IDUs associated with the lowest exposure time, although there was not a strong incremental dose-response pattern indicated. Statistics reflecting the amount of explained variance in the outcome (R^2 values) indicated that exposure time accounted for slightly less than 3 percent of the variance in each measure.

Other modeling strategies (analysis of covariance adjusting for baseline risk levels, two-way analysis of covariance with exposure time and covariance adjustments nested within sites) yielded only slightly better results. Main effects for exposure time continued to be statistically significant for both injection frequency and the needle risk index, but not for the sex risk index.

Regression models in which exposure time was treated as an interval-level variable were also examined, and an array of other variables were included as predictors of followup risk level (including baseline risk level). Results of the analysis for each outcome are shown in table 9. The incremental increase in the predictive power of the model is shown for each of four blocks of predictors.

The four blocks of predictors explained between 19 and 28 percent of the variance in the three outcome measures. With regard to injection drug use frequency and needle risk, Hispanics had higher risk scores at followup than blacks or whites. Intervention exposure time and time in drug abuse treatment resulted in significantly reduced risk scores. For sex risk, females had higher scores than males. In all three outcome measures, baseline scores accounted for the largest share of the variance.

The size of the combined sample from the nine NADR sites allowed for partitioning of the total sample of IDUs according to the predominant drugs injected before intake—i.e., heroin, cocaine, or both heroin and cocaine used with equal frequency. Analysis of these subgroups of IDUs revealed some interesting findings concerning treatment effects (see tables 10, 11, and 12). In particular, while time spent in drug treatment was a factor in risk reduction among IDUs who were predominantly heroin users, it was not a factor among the other two groups of IDUs. In contrast, increased time spent in NADR intervention was associated with reduced needle risk and reduced injection frequency in each of these subsamples. In other words, conventional drug treatment appears to be associated with reduced risk for IDUs whose primary drug is heroin, while the NADR intervention appears to have achieved reductions in risk across a broader range of IDUs.

Analysis of Intervention Components

It is clear that mere exposure time does not explain much of the variance in the outcome scores. Thus, an analysis was performed to examine the specific effects of various intervention components. A structured interview with the program directors at eight sites yielded information on the various components that composed the intervention sessions. Based on session attendance and intervention type, intervention component variables were calculated for 3,886 individuals from the eight sites.

Details on the intervention components are provided in table 13. The percentage of the total sample receiving the indicated intervention component is presented, along with figures for each of the eight sites. The components examined include providing bleach, demonstrating bleach use, assisting IDUs in practicing bleach use, providing condoms, demonstrating condom use, and assisting IDUs in practicing condom use. Data are also presented for attendance at a video or slide presentation, one-on- one sessions, various forms of group events or role-playing events, and didactic sessions. It was also possible to examine those who were given a book or brochure, a referral (HIV or HIV-related) and a quiz.

Results indicate that the components received by the largest percentage of IDUs were provision of bleach and condoms, frequently with a demonstration or practice exercise. A video/slide presentation and one or more individual sessions were provided to two-thirds of the sample. Approximately one- quarter of the sample received group or role-play sessions. It is also important to note that there was considerable variation both across and within the sites, with some components used at only a few sites.

An analysis of the 6-month individual mean change scores for the three risk score outcomes (injection drug use frequency index, needle risk index, and sex risk index) by the intervention components was performed. For the injection drug use frequency index, risk reduction was significantly greater among those who received a bleach demonstration; a practice session on bleach use; a condom and condom practice session; a video; role-playing on negotiation; assertiveness and interactions skills training; or various group sessions. For the needle risk scale, significantly greater risk reductions were achieved in conjunction with most of the intervention components used. For sex risk, the amount of risk reduction was small throughout the sample, and only a few components, such as condom distribution, video or slide presentation, and participation in a few of the types of group sessions, had a significant impact upon risk.

Because of the high level of association between some components (for example, almost everyone who received a condom also received bleach), the intervention components were combined to form four composite variables. The first composite reflects the simple dimension of being given a condom or bleach, or both. The second reflects the number of times the individual received a demonstration of using either bleach or a condom, combined with the number of practice sessions. The third score is a total of the type of group sessions in which the individual participated. Finally, the total number of role-play exercises were summed to construct the last composite. The distribution of these variables for the total sample and for the individual sites included in the analysis is presented in table 14.

Analysis of covariance was used to examine the risk scores at 6-month followup. The four intervention composite variables were entered as independent variables with the baseline risk score as the covariate. Examinations of means for the followup risk scores adjusted for the baseline scores reveal significant main effects for all intervention component variables. The general trend is toward greater risk reduction associated with greater intensity of the intervention component, though the results did not indicate a clear dose-response for the intervention.

The intervention components were also employed in a series of hierarchical regression analyses. For injection drug use frequency, the baseline injection frequency score accounted for 19 percent of the variance in the followup score. The intervention components and exposure time explained an additional 6 percent of the variance in the injection frequency score. The significant contributors to this explained variance include group sessions, role-play exercises, demonstration/practice exercises, and exposure time in minutes. Thus, for a model consisting of pretest score and the four intervention components and exposure time, a total of 25 percent of the variance in the followup injection frequency score was explained.

Regression results for needle risk scores were similar: 10 percent of the variance in the followup needle risk score was explained by the baseline score, and the intervention components and exposure time accounted for an additional 7 percent of variance (significant components were exposure time in minutes, role-play exercises, and demonstration/practice exercises).

Sex risk scores at followup remained the most difficult to predict, with the baseline explaining 18 percent of the variance in the 6-month followup score. An additional 1 percent was explained when the intervention components and exposure time were added to the model.

Results for the analysis based on the distinction of "successful/unsuccessful" described earlier are displayed in table 15. As shown, the mean scores for provision of condoms/bleach, number of demonstration/practice sessions, and number of group sessions are higher for those judged to be a "success" on the injection drug use frequency index. For the needle risk score, the "successful" group received a larger number of demonstration/practice sessions and group sessions. For sex risk, no significant differences were found.

II. Risk Behavior Assessment for Sex Partners of IDUs

Characteristics of the Sex Partners Sample

Analysis of data from interviews with sex partners of IDUs was performed for AIA-AFA linked data consisting of 1,127 females representing 18 NADR sites, and 510 males representing 17 sites. Site numbers for sex partners data correspond to site numbers for IDUs. Sites 6 and 17 did not have sex partner results for females or males; site 4 collected data for females but not for males.

The sociodemographic and background characteristics of the female sexual partners sample are presented in table 16 for the total sample and by site. Subjects averaged 31 years of age. Sixty-two percent were black, 25 percent were Hispanic, and 11 percent were white. Forty-five percent had completed a high school education, 51 percent were unemployed, 45 percent had previously been in jail, and 21 percent had been in drug treatment. Seven percent reported having traded sex for drugs, and 16 percent reported having traded sex for money.

The demographic profile of male sexual partners is presented in table 17, for the total sample and by site. Male sex partners averaged 35 years of age. Seventy-five percent were black, 11 percent were Hispanic, and 9 percent were white. Fifty-three percent had completed a high school education, 37 percent were unemployed, 74 percent had previously been in jail, and 29 percent had been in drug treatment. Thirteen percent had traded sex for drugs, and 12 percent reported having traded sex for money.

Changes From Baseline to Followup

Mean AIA and AFA values for selected risk behaviors for female and male sex partners are presented in tables 18 and 19. The results indicate substantial reductions in sex risk behavior at the 6-month followup. For instance, the proportion of subjects who reported having two or more sex partners decreased among females from 42 percent at AIA to 32 at AFA, and from 72 percent at AIA to 51 percent at AFA for males. Having two or more IDU sex partners fell from 15 percent at AIA to 8 percent at AFA for females and from 37 to 15 percent for males. Five percent of the females always used condoms at AIA, compared with 20 percent at AFA. Nine percent of the males always used condoms at AIA, compared with 24 percent at AFA.

Sexual Partners in Standard and Enhanced Interventions

The number of sexual partners assigned to the standard and enhanced interventions at sites that contributed intervention-specific data are shown in table 20. Of the 1,637 sex partners, 522 females and 196 males were assigned to a standard intervention, while 605 females and 314 males were assigned to the enhanced intervention.

Results on the sex risk scale are summarized in table 21. Overall, 30 percent of the total sample reported high scores at baseline, compared with 11 percent at followup, and 88 percent were regarded as having either reduced their level of risk or maintained low levels of risk. There was no significant difference in mean sex risk scale scores between the standard and enhanced intervention groups.

Analysis of covariance (ANCOVA) was used to measure the difference in mean sex risk scores for the standard and enhanced groups while adjusting for baseline sex risk scores. Separate ANCOVAs were performed for male and female sex partners. The mean sex risk scale score for males in the enhanced intervention was significantly lower than the mean for males in the standard intervention

(1.39 compared with 1.01, $p<0.001$). Results for females indicated no statistically significant difference between those in the standard interventions and those in the enhanced interventions.

As a complement to the gender-specific ANCOVAs, hierarchical regression techniques were applied to a joint sample of male and female sex partners. In order to strengthen the analytical focus, modifications similar to those presented earlier for IDUs were performed on the sexual partners sample. The sample for regression analysis was restricted to sites contributing at least 45 cases. By reducing those sites with disproportionately large numbers of cases by random sampling, a smaller but more proportionate sample of 892 cases was obtained.

A hierarchical regression predicting followup sex risk scores (comparable to table 9 for IDUs) is presented in Table 22. (The variable of "exposure time" could not be calculated for the sex partner data set with available national data, so the dichotomous intervention variable was used in the model.) Results of the regression analysis were consistent with the ANCOVAs described above. Low followup sex risk scores were associated with low AIA risk scores, as well as with being female, black, or unemployed. The effect of the intervention grouping was not statistically significant.

III. Knowledge of AIDS Among IDUs and Sexual Partners

The AIA and AFA instruments contained a 16-item "AIDS Information Sheet" developed to assess AIDS-related knowledge utilizing a true/false format. Item response rates of IDUs (percent answering correct) for whom intervention information was available (*N*=8,485) are presented in table 23. Results are provided for the AIA and AFA, by gender and race. For the total sample at AFA, on 13 of the 16 items, there was greater than an 80 percent correct response rate. Changes were evident from AIA to AFA in the direction of a higher rate of correct responses.

The item response rates of sex partners for whom intervention information was reported (*N*=1,637) are presented in table 24. Results for sex partners are comparable to results for IDUs. Again, many items were answered correctly by most respondents. Changes from AIA to AFA in terms of increases in correct responses were also similar to the IDU sample.

The 16-item quiz contains three subscales which were conceptualized to measure general AIDS knowledge, sex risk knowledge, and needle risk knowledge. Subscale scores indicate the number of correct responses. AIA and AFA mean scores on the AIDS knowledge quiz for the total score and the three subscales are presented in table 25. Means were compared using t-test for gender groups and analysis of variance for race groups within the IDU and sex partner samples. Overall, the findings indicate very high levels of AIDS-related knowledge among both IDUs and sex partners. In most groups, the average score was 14 correct responses out of a possible 16.

With only a few exceptions, knowledge levels about AIDS among white IDUs and sex partners were significantly higher than those among black or Hispanic IDUs and sex partners. Comparing male and female respondents yielded several findings that indicated greater knowledge about AIDS among female respondents. Results for IDUs indicate that at baseline, females scored higher on the sex risk knowledge subscale, the general risk knowledge subscale, and the total knowledge score. At AFA, female IDUs scored higher than male IDUs on the general risk knowledge subscale and on the total score, but there was no gender difference at AFA for the sex risk knowledge subscale. There were no differences by gender on the needle risk knowledge subscale at AIA or at AFA. Among sex partners, a significant gender difference at AIA was found in the sex risk subscale, where female sex partners scored higher than male sex partners. Female sex partners also achieved higher general risk scores and total knowledge scores at AFA than did male sex partners.

Comparisons were also made between the IDU sample and the sex partner sample. The comparison of mean scores between the samples, presented in table 26, indicates slightly higher AFA scores for sex partners on the sex risk knowledge subscale, the general risk subscale, and the total score.

While the differences between groups were frequently statistically significant, they were often small, suggesting that the items may not have been sensitive enough to detect subtle differences in knowledge levels that were high even at AIA. ANCOVA provides additional evidence that the scales may not have been sensitive enough to detect slight differences. Using ANCOVA, comparisons of knowledge scores revealed no significant difference in knowledge scale scores between subjects in standard and enhanced intervention groups.

There was some concern that the knowledge scale items might be culturally biased, explaining the consistent race difference in scores. While it is very difficult to assess this potential for bias, additional analyses showed that all race groups had similar patterns of correct responses. Results from a factor analysis of the 16 items indicate very similar factor structures across race groups, implying similar clustering of correct responses. This supports the view that the observed differences in knowledge (however slight) between the race groups were likely true differences in the level of knowledge rather than the result of bias in the items.

IV. Methodological Issues

As the findings presented above show, the NADR data provide a wealth of information regarding injection drug use, sex, and AIDS. The analyses provide answers to a number of critical questions pertaining to the level of risk of HIV infection among IDUs and their sex partners as well as the efficacy of educational intervention programs designed to reduce risk. Before discussing the implications of these findings, however, several methodological issues must be addressed. These issues revolve around basic scientific considerations, such as the representativeness of the data, the reliability of self-reported data, and the validity of the data collection process.

The first several methodological issues focus on the representativeness of the subjects included in the final analysis. These issues focus on changes over time, which can include factors such as shifts in enrollment in NADR over time and a comparison of those lost-to-followup to those who were followed. Another issue discussed here is the accuracy of the self-reported drug use data obtained. A third issue, the potential for bias as a result of the interviewer's race and/or sex, is also explored. Finally, the potential impact upon the research design of several intervening variables is considered.

Representativeness

Study Design Mortality

Design mortality in the NADR project was likely a result of a combination of factors. Some subjects actually died between the time of their initial assessment and their scheduled followup. Others moved or were jailed, hospitalized, or incapacitated in some other way, or were very often simply lost to the outreach workers whose job it was to locate the subjects for followup. Differential retention rates may also be a result of specific strategies employed by outreach workers at the NADR sites. For example, at some sites, high priority was given to locating and reinterviewing subjects who had been assigned to the enhanced intervention.

Since the effect of the intervention upon behavior is measured by contrasting pretest scores with followup scores, study mortality has important consequences for the way in which results are interpreted. Because posttest data are not obtained for subjects who drop out of the study, it is impossible to determine the impact of the intervention upon their behavior. However, pretest values can provide some insight into the characteristics of those subjects lost to followup.

In order to assess the impact of study mortality upon the evaluation of the intervention, two types of analyses were conducted. First, subjects who participated in followup interviews were compared with those who dropped out, on a number of variables including demographic characteristics such as gender, age, race, education, living arrangement, and employment, and risk measures such as drug, needle, and sexual behavior measures. Second, these univariate analyses were supplemented with a discriminant analysis in which the entire set of variables was tested in terms of predicting whether or not a subject was reinterviewed, which provided a profile of the differences between these two groups.

IDUs who were and were not followed are compared in table 28. Univariate results indicate that those followed up tended to be at lower sexual risk and have less AIDS-related knowledge. There was no difference in needle risk when comparing those followed with those lost to followup, although those followed had higher injection frequencies and had used injection drugs for a longer period as measured in years. Demographically, those followed tended to be of younger age, female, black or Hispanic, and less educated. In addition, those followed were less likely to be homeless.

Sexual partners who were and were not followed are also compared in table 28. There was no difference in sex risk when comparing those followed with those not followed, although sexual partners who were followed up were more likely to be older, female, black, to not be homeless, and to have ever had a sexually transmitted disease.

The stepwise discriminant analyses predicting followup (predictors statistically significant at $p<0.05$) are presented in table 29, and indicate results similar to the univariate findings. The most powerful predictors of followup were demographic variables rather than risk variables. This indicates that, overall, those subjects lost to followup in the NADR project tended to be at no higher or lower level of HIV risk than those who were followed up.

Enrollment in NADR and the Effect of History

In a true experimental design, the impact of factors other than the experimental effect can be neutralized through random assignment to experimental and control groups. When a design lacks a true control group, as in the quasi-experimental format employed in the NADR project, factors outside the design have a potentially more serious impact upon the interpretation of results. In particular, when data collection occurs over a long period of time, as in the NADR project, there is a substantial risk that broad changes that occur across the entire population of subjects as a result of external history effects may be indistinguishable from the change hypothesized within the design of the experiment.

With the attention given to AIDS by the popular press since the late 1980's, it is unlikely that NADR project interventions were the only sources of information about AIDS and HIV reaching the injection drug-using population between 1989 and 1991. Forces external to the intervention have probably been at work in the population of IDUs and their sexual partners (as in the general population) almost continuously since the early years of the AIDS epidemic. AIDS and HIV awareness campaigns have been conducted by numerous agencies using every conceivable medium.

It might appear that a simple test for history could be made by comparing pretest values for subjects recruited early in the study with those for subjects recruited much later; however, the possibility that validity is diminished by history is further complicated by a feature of the design itself. Specifically, it is possible that different segments of the IDU population were recruited to the project at different stages of the pretest data collection period. If these different segments of the IDU population were significantly different in terms of the outcome variables assessed in the study, a comparison of "early" and "late" subjects could mask the existence of a history effect.

Without a control group for comparison, the existence and magnitude of a history effect can be assessed only indirectly. We have attempted to isolate two sets of indicators in order to distinguish a history effect from any possible shift in the segment of the IDU population that was being recruited into the study. Each set of indicators was examined for evidence of change over time. The first set of variables is referred to as the *history effect indicators,* including knowledge of AIDS, frequency of injection, and level of risk for infection. These variables are relatively susceptible to change as a result of history. The second set of variables is referred to as *sampling bias indicators,* and includes characteristics such as ethnicity, age, primary injection drug, whether the subject had ever been in jail, and others. The variables in this second set are less susceptible to the effects of history but serve as possible indicators of qualitative changes over time in the type of subject being recruited into the study. Significant changes over time in the potential history effect indicators without similar changes over time in the sociodemographic characteristics of subjects (potential sampling bias indicators) can be interpreted as evidence of a history effect. Stability over time in the potential history effect indicators can be interpreted as evidence that there is no history effect. Changes in the history effect variables that are accompanied by changes in the characteristics of the subjects being recruited is the result that is the most difficult to interpret. It could indicate that what appears to be a history effect is actually due to shifts in the types of subjects being recruited. However, such a result would not exclude the possibility of a unique history effect over and above changes in subjects being recruited.

In order to assess whether significant changes were occurring over time, subjects were divided into groups according to the date of their AIA (pretest assessment). For statistical analyses, 3-month and 6-month groupings were compared to measure changes over time using Somers' asymmetric d. IDU results by month of AIA for selected variables are presented in table 30; monthly results for sexual partners are presented in table 31. Parametric analyses by AIA month indicates some statistically significant differences by ANOVA; however, given the inherent assumptions of such analyses, nonparametric procedures were selected for comparisons.

A summary of the analysis for IDUs and sexual partners is presented in table 32. Regarding the potential history effect variables, results indicate meaningful, yet very small, associations of time of AIA with outcome measures. As time progressed, NADR subjects were at less risk, with lower NOVA needle risk scores among the subjects recruited. Similarly, the level of AIDS knowledge was higher among subjects who were recruited later. This suggests a slight history effect in terms of decreased needle risk and increased AIDS-related knowledge over time. However, the results in table 32 also show some changes in the sampling bias indicators. Specifically, the data show a decline over time in the proportion of black subjects and in the proportion of subjects who reported cocaine as their primary injection drug. These effects are about as large as those obtained for the history effect indicators. As analyses reported above have shown, knowledge regarding AIDS was measurably lower among black respondents. Thus, increased knowledge of AIDS across the sample may be due merely to the decreasing proportion of black IDUs, refuting the history effect hypothesis. However, the decrease over time in needle risk is more problematic. Since IDUs for whom cocaine was the primary injection drug were less likely to be daily injectors (see table 3), a decrease over time in the proportion of these IDUs in the sample could reasonably be expected to be associated With increasing needle risk (due to increasing injection) in the sample. Instead, table 32 reveals steady injection frequency levels over time and decreasing needle risk over time. Consequently, the possibility of a modest history effect cannot be dismissed completely.

The Accuracy of Self-Reported Drug Use Data

Self-reports have always been an integral component of drug research. Not surprisingly, the issue of accuracy of self-reported drug use has been under almost continuous investigation (Stephens 1972). Most studies have used a test-retest check of reliability (Joe et al. 1990); many used some additional external means of verifying self-reports. For example, investigators have employed polygraph tests (Clark and Tifft 1966), official drug treatment records (Maddux and Desmond 1975), police records (Bonito et al. 1976), urinalysis (Ball 1967; Cox and Longwell 1974; Amsel et al. 1976; Page et al. 1977), and, most recently, hair assay (Baumgartner et al. 1979,1981; Valente et al. 1981).

Mieczkowski (1990) provides a comprehensive review of the literature on the accuracy of self-reported drug use. He concludes that most studies have shown that self-reports are fairly accurate, particularly for samples drawn from drug treatment populations.

To assess the veracity of NADR respondents, a special collaborative study using urinalysis was conducted at several NADR sites (Simpson et al. 1992). The findings indicated that respondents in the study reported their drug use quite accurately, based on comparisons of urinalysis results with usage reported in the prior 2 days and the prior 30 days. Using data from matched self-report and urinalysis records collected at the intake interview from five sites (*N*=528), comparisons were made for opiate drugs (including heroin, morphine, nonprescription methadone, etc.) and cocaine/crack. Specifically, rates for positive urinalysis results and self-reported use during the 2 days and 30 days prior to interview were tabulated, and agreement between urinalysis outcomes and self-reported use were then examined.

For opiates, 21 percent of the urine specimens were positive, compared with 32 percent who admitted using opiates in the prior 2 days; agreement between urinalysis results and 2-day self-reported opiate use was 84 percent. For cocaine/crack, 61 percent had positive urinalysis results and 54 percent admitted use in the prior 2 days, with 74 percent agreement. Further comparisons showed that of those users with positive urinalysis results for opiates (*N*=112), 88 percent admitted using opiates during the prior 2 days and 94 percent admitted use during the prior 30 days. For those with positive urinalyses for cocaine/crack (*N*=322), 73 percent admitted using these drugs during the prior 2 days and 95 percent during the prior 30 days. Levels of self-disclosure were high, and only 5 to 6 percent of those with positive urines denied their opiate or cocaine use during the prior month.

In addition, 38 percent (of 284 clients tested) tested positive for hepatitis B (using the core total antibody test), but percentages reported across the three sites reporting these data were very different (i.e., 76, 32, and 4 percent). Three groups were formed relative to injection frequency, and the high injection frequency group had a significantly higher rate of positive test results (13 percent among those with low injection frequency, 17 percent among those with medium injection frequency, and 70 percent among those with high injection frequency). This same pattern of findings was observed for each of the individual sites. These findings are similar to those of the studies cited above. Though self-reports are not infallible, these findings show them to be generally reliable indicators of actual drug use. It should be noted that a profitable, if difficult, avenue for additional study would be an understanding of the accuracy of respondents' self reports.

Potential Bias Introduced by Interviewer Race or Sex

Because the AIA and AFA contain numerous questions about a wide range of sexual behaviors, illicit drug use, and related sensitive topics, it is likely that some subjects misrepresented their behavior in the interview. Self-reports of some behaviors may have been underreported; others may have been inflated. Of course, the accuracy of self-reported data obtained in a face-to-face interview can be greatly enhanced by the confidence and trust that develops between the subject and a well-trained, professional interviewer. In order to increase the validity of the data collected in the AIA and AFA, all interviewers on the NADR project received extensive training in interviewing procedures, including techniques for establishing and maintaining an effective rapport with the subject.

It is difficult to obtain conclusive measures for assessing the impact of the interviewer upon the reliability of the data. Consequently, concerns about misrepresentations by subjects can never be completely dismissed. However, some simple analyses can help to illuminate the issue. In particular, an examination of the impact of matching subject and interviewer by gender and/or race provides one indication of the extent of bias introduced by the interviewer.

Subjects were categorized according to whether their gender and/or race matched that of the interviewer. Mean risk scores were compared for matched and unmatched subjects. The hypothesis regarding these comparisons was that subjects would be more willing to disclose high-risk behaviors to a same-sex and same-race interviewer, and that subjects with an opposite-sex or different-race interviewer would be more inclined to conceal high-risk behaviors that they believed might be seen as socially unacceptable by the interviewer. Thus, if bias was introduced by the interviewer's gender or race, it was expected to result in higher risk scores at AIA and AFA for matched subjects.

Tests for differences between the means revealed no consistent pattern and only very minor differences between subjects matched to interviewers by gender or race and unmatched subjects. The biggest difference was 0.28 scale points on the sex risk scale at AIA, where—contrary to the hypothesis—subjects with same-race interviewers reported lower levels of sex risk than did unmatched subjects. A similar difference was found between subjects with same-race interviewers and those with different-race interviewers on the needle risk scale, though the magnitude of the difference was even smaller. (No difference was found on the sex risk scale between subjects with same-gender interviewers and those with opposite-gender interviewers.) In contrast, differences in injection frequency showed subjects with same-gender interviewers at very slightly higher risk than subjects with opposite-gender interviewers; this was true on both the AIA and AFA. In general, the results fail to provide any clear evidence of bias introduced by the gender or race of the interviewer.

DISCUSSION AND CONCLUSIONS

The National AIDS Demonstration Research Project was initiated by the Community Research Branch of the National Institute on Drug Abuse in 1987. NADR programs had two primary research/intervention goals: 1) to accurately characterize the HIV-relevant behaviors of IDUs who currently were not in drug treatment and their sexual partners; and 2) to reduce the risk of HIV infection among IDUs and their sex partners by developing, implementing, and evaluating education/intervention strategies. The necessity of reaching IDUs who are not in treatment can hardly be overstated, since these data show that more than 40 percent of those targeted on the street had never been in treatment. The research/evaluation objectives within the second goal were to answer the following questions: 1) Can an outreach model be effective in reaching large numbers of out-of-treatment, at-risk IDUs and their sexual partners? 2) Do comparisons of pre- and posttest scores of risk behaviors provide evidence of positive behavior change? 3) In the absence of true control groups, do comparative models reveal significant effects (i.e., What is the differential impact of adding enhancements to a "standard" model?)? and 4) Is it possible to identify and specify common features across project models that are not only effective in changing risk behaviors but also practical, efficient, and, therefore, feasible for generalizability? In addition to summarizing answers to these questions, this section will discuss other analytic and policy issues relevant to the interpretation and implications of findings of the NADR project.

Overall Effect in Reaching Out-of-Treatment, At-Risk IDUs, and Sexual Partners

One obvious benefit of the NADR project cannot be fully documented. Tens of thousands of clients contacted at NADR sites across the nation were educated about AIDS and associated risk behaviors. The findings reported in this paper represent a subset of the total body of data collected on NADR clients. While this report on the efficacy of outreach/intervention relates only to those subjects included in the followup study, a volume produced by NADR investigators (Brown et al. 1993) explores the characteristics and functioning of more than 50,000 IDUs and sexual partners to whom AIAs were administered through the NADR project. Even that number does not include the many thousands more who made themselves accessible to outreach workers to receive counseling, literature, and AIDS prevention materials, but who were not referred for AIAs. As reported by Des Jarlais and Friedman (1987), many public officials doubted that IDUs would make themselves available to AIDS prevention efforts and, by extension, doubted the wisdom of spending public funds to reach that population. The NADR experience provides unqualified support to the argument that IDUs and their sexual partners can be reached and will be open to information and educational strategies to prevent the spread of AIDS.

Changes in Risk Behaviors

These projects demonstrate an overall effectiveness regarding change of HIV-related risk behaviors among IDUs and their sexual partners as measured by pretest/posttest design. Comparison of AIA and AFA data from IDUs revealed both statistically significant and clinically meaningful decreases in HIV-related risk behaviors following the intervention, including frequency of injecting drugs, use of noninjected drugs, use of borrowed injection equipment, and number of sex partners reported by the subject. Significant increases were observed in the use of new needles, the use of bleach to clean injection equipment between uses, and the use of condoms. Among sexual partners of IDUs, significant reductions were observed in the use of noninjected drugs and the number of sex partners. Sexual partners significantly increased their use of condoms as well.

The magnitude of behavioral change varied with the specific behavior, as well as for different segments of the sample. Analysis suggests that the intervention had even greater impact on specific needle-related behaviors—including decreasing sharing and increasing cleaning of works with bleach—than the more general drug-related behaviors (such as frequency of drug use), or changes in risky sexual behaviors. These results are similar to other studies (Turner et al. 1989; Abdul-Quadar et al. 1990; Robert et al. 1990), in that the NADR interventions achieved greater changes in drug-related risk behaviors than in sex-related risk behaviors, though reductions in the number of IDU sex partners and increased use of condoms were noted.

A number of recent studies have suggested that peer pressure and social support may be important elements in influencing sexual risk reduction, not only among gay men (Joseph et al. 1987) but also among IDUs (Abdul-Quadar et al. 1990; Magura et al. 1990). Sexual behavior is influenced by community standards and expectations of what is acceptable and normal. For example, within certain ethnic communities, cultural constraints can inhibit a woman from taking a more active role in introducing the use of condoms into a sexual relationship (Turner et al. 1989). New intervention programs should specifically and cogently address issues concerning social relationships in attempting to modify high-risk sexual behavior.

Overall, the changes in risk behavior are very dramatic. Particularly noteworthy is the considerable reduction in self-reported use of drugs. Indeed, these changes are some of the most noteworthy ever reported in the drug abuse literature.

Differential Impact of Comparison Groups

Given that a true control group was ethically unacceptable (it would have been irresponsible to withhold prevention strategies likely to be effective from groups known to be at high risk for HIV), it is impossible to adequately address all issues of internal validity (McCoy et al. 1990). Given this and the other methodological issues described above which potentially impact the validity of the findings, such as effects of external history, subject mortality, sampling and interviewer bias, self-report, etc., the analyses still suggest that significant changes did occur in risk behaviors and were attributable in part to the interventions. Some degree of caution is indicated, however, since the effects of interventions may be confounded by secular trends resulting from increased media dissemination of information regarding principal modes of transmission of AIDS as well as fear of contracting a fatal disease.

Although no true control group could be established, another type of quasi-experimental design was employed to determine whether further enhancements to the standard intervention model would result in increased increments of change in risk behaviors. In this design, a two-group comparison was conducted between subjects assigned to standard or enhanced interventions. All study participants received a standard intervention, although-the composition of the standard varied among sites.

While analyses revealed that several specific components of the enhanced intervention appeared to have had modest generalizable consequences in risk reduction, results indicate that the largest percentage of IDUs were provided components dealing with bleach and condoms, frequently including demonstrations and skills reinforcement. In addition, the large majority of IDUs took part in video/slide sessions, whereas a smaller proportion received group or role-play sessions. In practical terms, the question arises as to whether the standard components may be as effective and efficient as the less cost effective enhanced components. Additionally, these studies raise important questions concerning the threshold effect of the interventions (i.e., How much more effort is required to gain additional effectiveness?).

Another important issue involves the question of whether the intervention had a lasting impact on reducing high-risk behavior. This is difficult to answer, since the evaluation was conducted by measuring at only two points in time. The ultimate test of the effectiveness of risk reduction intervention programs lies in the extent to which standardized models of positive behavior changes can be sustained over time, and further analyses of data at longer-term followup assessments are needed to provide this information. The NADR programs, as well as others, have provided evidence of the resilience of reductions in risk behaviors over extended time periods. These studies indicate that positive behavior changes obtained within the first followup period (approximately 6 months) are reduced only slightly over longer time periods of up to 24 months (Stephens 1990; McCoy et al. 1992; Weatherby and Miles 1992). Future research projects are urged to accept the challenge to test further the question of durability and long-term maintenance of risk behavior changes in these targeted populations.

Other factors linked to the level of risk were identified in a series of ANCOVA models. At followup, Hispanic IDUs, those who were unemployed, those who had previously been in drug treatment, those whose primary injection drug was heroin, and those who had longer histories of drug injection reported greater use of injected drugs than did other IDUs.

Overall needle-related risk was reduced most significantly among black IDUs, whereas female and white non-Hispanic IDUs reported significantly higher levels of sex-related risk behaviors than did other IDUs. Why and how did these interventions have differential impact upon various subgroups? To adequately answer these and other questions of differential impact, greater utilization of process measures is recommended for future research. Process data will provide more refined information about the most effective methods of delivering intervention components within various subgroups, individual agencies, and different sociocultural environments.

Generalizability of Project Interventions

In this section, the importance of the NADR project is viewed from the public policy perspective. Interpretation of the foregoing results suggests that these projects represent emergent public health models—practical, highly effective, and efficient alternative prototypes for urban communities—for intervening with IDUs and their sexual partners to retard the transmission of AIDS.

Effective public health action must be based on accurate knowledge of both the cause and distribution of health problems as well as on the experience of effective interventions. Despite much progress, the knowledge base is still inadequate for many public health problems. Implementation and evaluation of the NADR demonstration programs has established an essential initial foundation—knowledge and experience required for the construction of practical, effective, and efficient public health models. Emerging from these demonstration programs have been innovative strategies for inducing positive behavioral change in high-risk individuals. Although funded as separate, broad-based demonstrations, common elements of effectiveness were ascertained among the sites.

Many common features of the NADR programs that should be considered prototypic components of public models include:

- The use of outreach workers/recruiters who were frequently ex-addicts and indigenous to the targeted communities

- Recruitment of target populations who were currently using injection drugs and were not in drug abuse treatment (and, in many instances, had never been in drug abuse treatment) or were the sexual partners of IDUs

- The use of staff trained to administer a structured interview to assess current risk behaviors, appropriate sociodemographic information, and knowledge about AIDS

- The opportunity to administer a blood test to determine the presence of antibodies to HIV, accompanied by appropriate pre- and posttest counseling

- Administration of a risk reduction intervention embracing, at least, clarification of the process of AIDS transmission, provision of bleach and condoms (with a demonstration of their use and playback by the client), reinforcement for the adoption of risk reduction behaviors, and specific training in refusal skills and negotiation skills.

Since the NADR programs reported effectiveness in gaining compliance by IDUs in the use of bleach to clean their works, it is important to note some of the latest research relative to bleach as an agent to inactivate the HIV-1 virus. The efficacy of bleach (i.e., its potential for inactivation of the HIV virus) became an important research issue during the course of these projects. Therefore, NADR researchers carried out a series of studies demonstrating the presence of antibodies in needles and syringes collected within shooting galleries and the effectiveness of bleach in the in activation of the virus. This research provided a very precise estimate of the 30 seconds or longer required to inactivate this virus (Shapshak et al. 1993; McCoy et al. 1993). In another series of studies (Shapshak and

McCoy, Spring 1993), clotted and unclotted blood was tested in a syringe and found that the virus was inactivated after exposure to two bleach rinses at intervals of 15 seconds each. This research additionally illustrates the effectiveness of the demonstration projects in clarifying many crucial issues and refining the interventions as necessary in order to address the development, implementation, and transference of public intervention models. Subsequent projects should utilize a standardized common protocol for instruction and demonstration of bleach cleansing.

Results of the NADR project are being disseminated by NIDA as well as by individual project participants through the routine channels of peer-reviewed journals and other professional publications. In the dissemination of these results, several programs have been highlighted by NIDA as replicable models of effective outreach-based interventions designed to reduce AIDS-related risk behavior among IDUs and their sexual partners (Wiebel 1993; Rhodes et al. 1993; Coyle 1993). As another example, results of the intervention model utilized by the Miami NADR program have been published by the research team, not only to inform the scientific community but, in other forms, to educate and stimulate discussion in the public arena (McCoy and Khoury 1992; McCoy et al. 1992; Chitwood et al. 1991).

It would be difficult to overemphasize the findings from the NADR project. At sites across the country, injection drug users who were not in drug abuse treatment and the sexual partners of injection drug users were found to be accessible to strategies of AIDS risk reduction, and were found to dramatically reduce their risk for contracting and spreading that lethal disease in association with the introduction of those strategies. Moreover, not only were the injection drug users recruited through NADR not in treatment at the time of contact, over 40 percent had never been in treatment in spite of averaging more than a decade of injection drug use. Clearly, the outreach/intervention strategies developed, tested, and found effective under NADR successfully reached a population at very great risk. These strategies need to be made a part of our public health response to AIDS.

In a real sense, outreach/intervention to prevent AIDS complements drug abuse treatment, serving the needs of those who will not or cannot access drug abuse treatment. It is no denigration of drug abuse treatment to say we need to implement—and quickly—these additional strategies if we mean to protect the lives of all of our client population and to guarantee the safety of their communities.

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Exhibit A

NADR Research Consortium

Exhibit A. NADR Research Consortium

City	Institution	Principal Investigator
Boston	Project Outreach/ Harvard Medical School	William E. McAuliffe, Ph.D.
Chicago	University of Illinois	Wayne Wiebel, Ph.D.
Cincinnati	The Cincinnati Health Department	Stanley E. Broadnax, M.D.
Cleveland	Cleveland State University	Richard C. Stephens, Ph.D.
Dallas	DARCO Drug Services, Inc.	Deena D. Watson, M.A.
Dayton/Columbus	Wright State University	Harvey A. Siegal, Ph.D.
Hartford	Hispanic Health Council	Jean J. Schensul, Ph.D. Merrill Singer, Ph.D.
Hawaii	CHOW Project	Sena Gates, B.A.
Houston	Affiliated Systems Corporation	Mark L. Williams, Ph.D.
Long Beach	California State University, Long Beach	Fen Rhodes, Ph.D.
Miami	University of Miami	Clyde B. McCoy, Ph.D.
Minneapolis/St. Paul	University of Minnesota	James Halikas, M.D. Richard H. Needle, Ph.D.
Newark	New Jersey State Department of Health	John F. French, Ph.D. Robert Baxter, M.Ed.
Jersey City	New Jersey State Department of Health	John F. French, Ph.D. Robert Baxter, M.Ed. Jerry Platt, Ph.D.
New Haven	APT Foundation Substance Abuse Treatment Unit	Bruce J. Rounsaville, M.D.
New Orleans	Desire Narcotic Rehabilitation Center, Inc.	Vernon Shorty, M.A.

Exhibit A. NADR Research Consortium (Continued)

City	Institution	Principal Investigator
New York	Narcotic and Drug Research, Inc.	Samuel R. Friedman, Ph.D.
New York	Narcotic and Drug Research, Inc.	Sherry Deren, Ph.D.
Paterson	New Jersey State Department of Health	John F. French, Ph.D.
Philadelphia	Philadelphia Health Management Corporation	Lynne Kotranski, Ph.D.
Pittsburgh	Allegheny County MH/MR Drug and Alcohol Program	Annette Green, M.S.W.
Portland	Oregon State Health Division	David Fleming, M.D.
Puerto Rico	Department of Anti-Addiction Services	Rafaela R. Robles, Ed.D.
San Antonio	University of Texas Health Science Center at San Antonio	Kenneth N. Vogtsberger, M.D.
San Francisco	Youth Environment Study, Inc.	Harvey W. Feldman, Ph.D. Pat Biernacki, Ph.D.
San Francisco	AIDS Office	Patricia E. Evans, M.D.
Seattle	King County AIDS Project	Robert W. Wood, M.D.
Tucson	Amity/COPASA	Sally Stevens, Ph.D. Peggy J. Glider, Ph.D.
Washington, D.C.	ADASA	Larry J. DeNeal, Ph.D.

Exhibit B

NOVA Needle Risk and NOVA Sex Risk

Exhibit B. NOVA Needle Risk and NOVA Sex Risk

NOVA Needle Risk[1]

Variable	Score	Definition
Number	0	None (did not share needles with anyone)
	1	Shared needles with one person
	2	Shared needles with two or more persons
Used Needle	0	Did not inject with a used needle
	1	Injected with a used needle
New/Clean	0	Always injected with a new or bleach-cleaned needle
	1	Always injected with a new or bleach-cleaned needle, but shared cooker, cotton, or rinse water with others
	2	Did not always inject with a new or bleach-cleaned needle

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[1] To obtain a summary score of needle risk, each individual was classified according to each of these variables, and the sum of the three risk scores was obtained. A total score of 0 or 1 was considered low risk; 2 or 3, intermediate; and 4 or 5, high risk.

Exhibit B. NOVA Needle Risk and NOVA Sex Risk (Continued)

NOVA Sex Risk[2]		
	Score	
Description	Insertive	Receptive
No sex in past 6 months	0	0
Sex (all types) but not with an IDU	0	0
ONE IDU PARTNER:		
Vaginal sex, always use condom	0	0
Oral sex, always use condom	0	0
Anal sex, always use condom	1	2
Vaginal sex, sometimes use condom	1	2
Oral sex, sometimes use condom	0	1
Anal sex, sometimes use condom	2	4
Vaginal sex, never use condom	2	4
Oral sex, never use condom	1	2
Anal sex, never use condom	3	6
MORE THAN ONE IDU PARTNER:		
Vaginal sex, always use condom	1	2
Oral sex, always use condom	1	2
Anal sex, always use condom	2	4
Vaginal sex, sometimes use condom	2	4
Oral sex, sometimes use condom	1	3
Anal sex, sometimes use condom	3	6
Vaginal sex, never use condom	3	6
Oral sex, never use condom	2	4
Anal sex, never use condom	4	8

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[2] A summary score for each individual was obtained by adding scores for each sexual behavior combination. A summary score of 0 implied low risk; 1-5 was intermediate; and 6 or more implied high risk.

Exhibit C

Members
National AIDS Research Consortium

Exhibit C. Members National AIDS Research Consortium

Name	Title	Affiliation
Marcia Andersen, Ph.D.	Principal Investigator	Personalized Nursing Corporation Detroit, MI
Robert Baxter, M.Ed.	Co-Principal Investigator	New Jersey State Department of Health Newark, NJ
Sandra Baxter, Ph.D.	Principal Investigator	The Circle, Inc. McLean, VA
Pat Biernacki, Ph.D.	Co-Principal Investigator	Youth Environment Study, Inc. Oakland, CA
Stanley E. Broadnax, M.D.	Principal Investigator	The Cincinnati Health Department Cincinnati, OH
Vivian B. Brown, Ph.D.	Deputy Principal Investigator	PROTOTYPES/W.A.R.N. Culver City, CA
Willie Davis, M.B.A.	Principal Investigator	Birch and Davis Associates, Inc. Silver Spring, MD
Larry J. DeNeal, Ph.D.	Principal Investigator	ADASA Washington, DC
Sherry Deren, Ph.D.	Principal Investigator	Narcotic and Drug Research, Inc. New York, NY
Patricia E. Evans, M.D.	Principal Investigator	AIDS Office San Francisco, CA
Harvey Feldman, Ph.D.	Principal Investigator	Youth Environment Study, Inc. Oakland, CA
David Fleming, M.D.	Principal Investigator	Oregon State Health Division Portland, OR
John F. French, Ph.D.	Principal Investigator	New Jersey State Department of Health Trenton, NJ

Exhibit C. Members National AIDS Research Consortium (Continued)

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Exhibit C. Members National AIDS Research Consortium (Continued)

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Exhibit C. Members National AIDS Research Consortium (Continued)

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Tables

Table 1. Sociodemographics by NADR Site (IDUs)

(Expressed in Percent — except where otherwise noted)

			Race/Ethnicity								Predominant IDU						
NADR Sites	N	Age (Mean)	Black	Hispanic	White	Female	HS Graduate	Un-employed	Ever In Jail	Ever In Drug Treatment	Heroin	Cocaine	Heroin & Cocaine	Years of IV (Mean)	Sex Partners (Mean)	AIDS[1] Incidence Rate	HIV[2] Positive IDUs
1	531	35	74	9	16	32	51	45	90	47	11	34	43	14	16	104	32
2	614	36	76	1	22	28	54	35	85	61	22	24	15	14	7	8	1
3	516	38	87	1	11	20	50	42	75	55	15	43	14	15	7	10	—
4	540	37	39	25	35	34	53	51	93	59	35	7	47	15	18	—	6
5	549	39	74	23	3	33	52	74	74	74	26	21	43	19	17	80	—
6	1,577	32	10	81	8	21	39	52	64	60	16	6	75	12	7	50	42
7	1,318	35	22	61	17	22	31	53	90	58	57	12	19	15	13	17	1
8	436	38	93	0	7	12	38	54	84	51	8	57	15	16	4	34	3
9	1,246	35	63	6	31	36	49	54	94	45	31	19	35	14	24	29	3
10	131	34	61	10	29	27	42	54	70	75	17	48	25	14	8	18	—
11	592	33	77	13	9	27	42	74	73	50	37	11	41	12	2	74	42
12	745	35	81	15	4	27	43	75	72	53	34	11	52	14	2	50	48
13	270	35	47	39	12	18	38	68	84	66	24	22	43	15	13	15	43
14	143	35	9	6	51	16	60	29	80	59	17	43	6	13	24	17	5
15	297	35	64	9	26	23	54	53	79	66	30	26	32	15	5	24	—
16	343	35	67	24	8	29	35	58	86	74	39	10	40	15	5	—	51
17	884	34	28	1	65	29	48	56	86	66	32	18	16	13	10	18	1
18	177	38	67	5	24	30	57	50	93	67	30	16	27	16	5	20	—
19	317	34	36	6	30	29	53	48	86	72	14	38	6	13	3	8	3
20	276	33	12	41	41	34	43	68	94	62	27	21	21	12	33	6	3
21	294	37	48	12	38	26	36	45	90	62	22	36	33	16	36	21	—

Table 1. Sociodemographics by NADR Site (IDUs)
(Expressed in Percent — except where otherwise noted)

			Race/Ethnicity								Predominant IDU						
NADR Sites	N	Age (Mean)	Black	Hispanic	White	Female	HS Graduate	Un-employed	Ever in Jail	Ever in Drug Treatment	Heroin	Cocaine	Heroin & Cocaine	Years of IV (Mean)	Sex Partners (Mean)	AIDS[1] Incidence Rate	HIV[2] Positive IDUs
22	318	31	53	22	26	27	37	50	76	29	6	11	6	10	16	80	7
23	478	34	47	37	26	28	42	75	76	75	29	11	16	10	10	80	59
24	84	40	51	15	27	37	60	49	93	71	39	7	27	19	15	129	—
25	366	35	37	45	56	26	55	44	76	71	26	81	76	14	12	18	23
26	142	36	69	0	5	26	52	50	72	67	36	11	30	10	5	34	—
27	193	34	69	0	26	26	58	50	71	64	16	23	29	12	3	5	—
28	98	34	26	0	5	31	67	61	76	61	39	11	30	16	3	129	—
Total	13,475	26	51	15	22	26	45	55	81	59	28	11	30	14	12	—	—

[1] Source: HIV/AIDS Surveillance, Centers for Disease Control, December 1991. Rate per 100,000 population.
[2] Source: National NADR Database, January 31, 1992.

Table 2. Initial-to-Follow-Up Changes in Risk Behavior (IDUs) (Expressed in Percent)

	Share Needles 2+ Partners		Rent Needles		Borrow Needles		Share Cooker/ Cotton		Share Rinse Water		Not Always Sterile Needle		Repeat Use Needle		Not Always New Needle		Use Unsafe Needles		Sex With Two or More Partners		Not Always Use Condoms	
NADR Sites	AIA	AFA	AIA	AFA	AIA	AFA	AIA	AFA	AIA	AFA	AIA	AFA	AIA	AFA	AIA	AFA	AIA	AFA	AIA	AFA	AIA	AFA
1 (N = 531)	52	13	37	10	52	16	66	26	54	19	62	20	89	46	78	42	67	34	70	60	88	68
2 (N = 614)	51	12	25	7	44	12	69	36	52	22	59	29	84	54	75	50	61	35	52	49	95	85
3 (N = 516)	45	10	26	8	39	10	70	24	51	18	59	24	84	45	66	34	53	23	57	42	93	75
4 (N = 540)	64	36	31	16	62	39	75	55	66	48	75	51	95	80	93	78	78	55	42	35	95	85
5 (N = 549)	39	11	22	7	31	10	67	31	46	23	45	22	79	52	65	47	52	36	52	40	86	65
6 (N = 1,577)	39	25	26	15	41	24	76	52	47	29	47	31	85	72	81	68	73	58	24	21	86	75
7 (N = 1,318)	70	42	29	10	64	43	84	65	82	62	80	66	95	84	91	80	83	68	38	33	95	93
8 (N = 436)	74	25	40	18	47	22	58	31	58	28	78	51	89	62	75	46	72	39	58	50	92	86
9 (N = 1,246)	70	18	22	6	53	24	76	44	72	40	63	30	91	62	84	58	72	47	46	41	94	90
10 (N = 131)	62	31	30	16	43	24	58	43	59	40	48	31	84	62	60	55	50	37	37	33	90	82
11 (N = 592)	36	13	20	9	28	14	60	33	44	26	55	48	83	66	74	56	54	35	36	29	80	72
12 (N = 745)	28	12	16	3	26	11	60	34	47	23	63	55	82	63	79	61	61	37	36	27	87	71
13 (N = 270)	64	40	39	23	54	34	82	60	71	50	75	57	97	86	86	70	70	48	34	35	83	70
14 (N = 143)	68	45	33	21	66	39	76	49	73	41	77	55	91	70	81	59	76	50	53	44	94	82
15 (N = 297)	36	14	19	8	31	17	65	45	55	36	58	40	92	70	76	62	63	46	38	32	68	66
16 (N = 343)	45	12	25	7	39	13	74	36	57	30	63	39	91	60	75	46	66	38	45	26	89	68
17 (N = 884)	55	23	20	8	56	27	82	48	71	40	73	41	92	59	89	57	83	49	49	35	93	89
18 (N = 177)	56	26	27	12	52	26	82	58	64	45	70	45	89	72	76	64	64	53	46	44	92	82
19 (N = 317)	73	19	28	10	50	19	65	32	54	30	65	33	86	52	75	42	65	35	48	34	92	85
20 (N = 276)	55	21	21	9	55	25	75	37	64	30	61	32	89	50	85	44	75	39	49	32	88	87
21 (N = 294)	77	30	48	29	64	38	83	70	66	50	74	56	93	90	85	82	71	64	57	51	90	86
22 (N = 318)	58	26	22	11	50	24	60	40	54	35	66	40	85	59	77	57	63	46	60	56	96	92

Table 2. Initial-to-Follow-Up Changes in Risk Behavior (IDUs)
(Expressed in Percent)

	Share Needles 2+ Partners		Rent Needles		Borrow Needles		Share Cooker/ Cotton		Share Rinse Water		Not Always Sterile Needle		Repeat Use Needle		Not Always New Needle		Use Unsafe Needles		Sex With Two or More Partners		Not Always Use Condoms	
NADR Sites	AIA	AFA	AIA	AFA	AIA	AFA	AIA	AFA	AIA	AFA	AIA	AFA	AIA	AFA	AIA	AFA	AIA	AFA	AIA	AFA	AIA	AFA
23 (N = 478)	50	24	24	12	40	23	74	49	53	36	85	51	83	77	66	68	77	60	41	34	83	69
24 (N = 84)	52	29	19	6	30	24	64	58	46	43	51	53	83	86	83	77	48	38	49	38	83	78
25 (N = 366)	71	47	91	14	67	14	88	57	75	57	79	53	90	57	90	48	79	68	49	40	94	87
26 (N = 142)	71	21	37	14	56	22	88	57	94	49	79	40	91	60	88	56	73	47	53	43	88	74
27 (N = 193)	71	14	24	7	36	13	71	35	66	32	68	40	91	57	69	47	62	36	49	24	92	87
28 (N = 98)	52	12	26	6	38	18	61	43	46	29	56	45	85	70	66	57	47	29	28	36	90	82
Total (N = 13,475)	54	23	89	11	48	24	89	45	60	36	54	41	89	66	81	60	69	47	44	36	90	81

Table 3. Initial-to-Follow-Up Changes in Drug Use (IDUs)
(Expressed in Percent)

	Daily Non-IV Drug Use								Daily IV Drug Use					
	Marijuana		Crack Cocaine		Powder Cocaine		Heroin		Cocaine		Heroin		Speedball	
NADR Sites	AIA	AFA	AIA	AFA	AIA	AFA	AIA	AFA	AIA	AFA	AIA	AFA	AIA	AFA
1 (N = 531)	23	13	35	26	16	6	5	1	31	7	24	7	27	9
2 (N = 614)	14	8	19	10	7	2	2	1	16	4	21	10	8	5
3 (N = 516)	15	4	23	8	14	5	3	2	28	5	15	6	7	2
4 (N = 540)	10	4	15	8	7	3	2	1	18	10	60	29	43	29
5 (N = 549)	14	8	30	18	14	5	15	2	37	12	46	13	35	13
6 (N = 1,577)	16	8	3	2	10	4	13	5	51	32	67	40	70	48
7 (N = 1,318)	16	11	5	2	2	0	1	0	16	13	59	46	16	12
8 (N = 436)	18	9	17	4	12	4	2	1	34	14	12	5	7	3
9 (N = 1,246)	13	7	9	5	4	2	3	1	26	11	53	18	34	15
10 (N = 131)	9	10	14	8	8	11	3	1	44	19	30	20	21	11
11 (N = 592)	9	1	10	1	15	3	23	6	27	12	54	27	30	12
12 (N = 745)	9	2	8	2	14	5	25	11	38	17	70	33	47	17
13 (N = 270)	45	25	53	36	37	28	15	7	9	4	10	4	6	4
14 (N = 143)	37	17	8	4	5	1	2	0	21	12	17	3	3	1
15 (N = 297)	8	5	12	5	11	4	10	2	35	21	47	20	25	11
16 (N = 343)	4	1	18	12	5	2	11	3	17	6	47	20	22	7
17 (N = 884)	17	10	10	3	5	1	1	0	13	7	30	14	11	4
18 (N = 177)	16	6	19	9	10	3	5	1	22	6	38	21	20	6
19 (N = 317)	21	10	11	3	9	3	1	0	14	5	11	4	2	1
20 (N = 276)	24	13	10	2	7	3	2	0	24	7	36	15	18	6
21 (N = 294)	19	12	4	3	7	3	5	3	43	27	38	24	21	17

Table 3. Initial-to-Follow-Up Changes in Drug Use (IDUs)
(Expressed in Percent)

	Daily Non-IV Drug Use								Daily IV Drug Use					
	Marijuana		Crack Cocaine		Powder Cocaine		Heroin		Cocaine		Heroin		Speedball	
NADR Sites	AIA	AFA	AIA	AFA	AIA	AFA	AIA	AFA	AIA	AFA	AIA	AFA	AIA	AFA
22 (N = 318)	27	19	13	11	9	5	7	1	20	19	7	4	2	7
23 (N = 478)	3	8	17	13	6	8	11	8	38	23	66	37	8	31
24 (N = 84)	11	2	15	12	9	2	1	1	11	1	50	10	22	7
25 (N = 366)	13	8	14	5	12	8	5	2	38	18	32	19	18	6
26 (N = 142)	3	8	22	2	14	1	5	5	24	8	43	19	23	14
27 (N = 193)	6	8	3	3	8	8	2	1	27	8	27	17	24	14
28 (N = 98)	11	19	11	27	11	3	13	1	13	4	42	31	19	11
Total (N = 13,475)	15	8	12	6	9	8	7	2	29	14	15	24	29	16

Table 4. Followup Rates and Final Sample Sizes by Site and Intervention Group (IDUs)

NADR Sites	Followup	Standard	Enhanced	Total
Site #1	59	300	229	529
Site #2	49	183	262	445
Site #3	68	124	389	513
Site #4	41	281	259	540
Site #5	27	186	218	404
Site #6	74	814	763	1,577
Site #7	57	632	624	1,256
Site #8	33	198	231	429
Site #9	31	339	344	683
Site #10	10	50	44	94
Site #11	5	36	54	90
Site #12	14	307	21	328
Site #13	37	0	267	267
Site #14	10	72	65	137
Site #15	7	0	67	67
Site #16	42	118	209	327
Site #17	10	69	144	213
Site #18	2	14	9	23
Site #19	45	99	216	315
Site #20	16	110	138	248
Total	32	3,932	4,553	8,485

Table 5. Summary of Results for IDU Frequency Index

		Total Sample Percent of IDUs Injecting Daily			Percent Success and Mean Index Scores by Intervention Group[1]	
NADR Sites	N	AIA	AFA	Percent Success	Standard	Enhanced
Site #4	512	91	21	71	70 (1.9)	73 (1.7)
Site #2	406	85	21	62	64 (1.6)	61 (1.9)
Site #9	504	89	14	78	78 (1.4)	78 (1.4)
Site #4	515	71	91	42	36 (3.6)	47 (3.2)
Site #9	367	71	36	58	56 (2.6)	64 (2.4)
Site #6	1,553	91	68	29	31 (4.1)	27 (4.3)*
Site #4	1,199	42	58	34	34 (3.6)	33 (3.8)
Site #8	183	47	22	58	56 (2.4)	59 (2.2)
Site #9	665	77	33	58	58 (2.7)	64 (2.4)
Site #10	85	79	89	78	39 (3.6)	54 (2.6)*
Site #11	89	67	36	58	66 (2.5)	54 (2.6)
Site #12	320	87	52	45	44 (3.4)	62 (2.6)
Site #13	251	77	67	34	n/a (n/a)	34 (n/a)
Site #14	133	47	14	65	63 (2.1)	67 (2.0)
Site #15	62	67	40	57	n/a (n/a)	58 (n/a)
Site #16	251	70	32	57	62 (2.2)	53 (2.4)
Site #14	206	89	19	65	59 (2.2)	67 (1.8)
Site #18	19	71	42	47	46 (2.8)	50 (3.0)
Site #19	311	30	14	68	77 (1.4)	64 (1.7)
Site #20	244	85	21	65	64 (1.9)	68 (1.6)
Total	8,095	70	42	50	48 (3.0)	51 (2.8)*

[1] Means for raw index scores at AFA of standard and enhanced groups are reported in parentheses.

* Denotes mean scores that were significantly different ($p < 0.05$).

Table 6. Summary of Results for Needle Risk Index (IDUs)

		Total Sample Percent of IDUs at High Risk			Percent Success and Mean Index Scores by Intervention Group[1]	
NADR Sites	*N*	AIA	AFA	Percent Success	Standard	Enhanced
Site #8	519	61	17	79	72 (1.5)	70 (1.4)
Site #7	405	59	17	72	73 (1.4)	71 (1.6)
Site #3	448	59	48	72	83 (1.1)	76 (1.2)
Site #4	527	72	43	48	45 (3.0)	51 (2.6) *
Site #5	307	48	16	62	64 (1.6)	62 (1.4)
Site #6	1,525	48	32	47	48 (2.6)	46 (2.7)
Site #7	1,230	78	93	38	37 (3.2)	40 (3.2)
Site #8	365	70	29	68	56 (2.0)	65 (2.0)
Site #9	673	78	29	66	62 (2.2)	70 (2.0)
Site #10	83	61	37	47	37 (2.8)	60 (2.2)
Site #11	72	16	12	79	73 (1.4)	85 (1.2)
Site #12	316	24	9	65	64 (1.4)	70 (1.4)
Site #19	229	67	93	19	n/a (n/a)	48 (n/a)
Site #19	125	77	16	19	42 (2.9)	44 (2.9)
Site #19	64	16	23	64	n/a (n/a)	64 (n/a)
Site #16	301	59	48	71	65 (1.7)	74 (1.6)
Site #17	210	93	31	65	60 (2.4)	67 (2.0)
Site #17	19	78	48	53	57 (2.4)	40 (2.1)
Site #19	292	66	25	68	71 (1.7)	66 (1.8)
Site #20	222	64	27	62	56 (2.0)	67 (1.6)
Total	7,932	62	31	57	55 (2.3)	59 (2.2) *

[1] Means for raw index scores at AFA of standard and enhanced groups are reported in parentheses.

* Denotes mean scores that were significantly different ($p < 0.05$).

Table 7. Summary of Results for Sex Risk Index (IDUs)

		Total Sample of IDUs at High Risk			Percent Success and Mean Index Scores by Intervention Group[1]	
NADR Sites	*N*	AIA	AFA	Percent Success	Standard	Enhanced
Site #1	512	23	9	72	75 (1.5)	69 (1.8)
Site #7	434	18	9	67	67 (1.5)	67 (1.4)
Site #3	508	19	6	75	70 (1.1)	77 (1.0)
Site #4	533	19	11	65	63 (2.0)	67 (1.4) *
Site #5	305	24	8	75	74 (1.3)	76 (1.0)
Site #6	1,569	10	6	67	87 (0.8)	87 (0.7)
Site #7	1,235	17	11	63	61 (1.8)	65 (1.7)
Site #8	415	19	7	63	66 (1.4)	70 (1.5)
Site #9	681	18	10	64	63 (1.8)	66 (1.6)
Site #10	91	11	8	63	65 (1.7)	60 (1.7)
Site #11	90	7	6	77	83 (0.7)	72 (1.1)
Site #12	323	10	5	67	79 (0.9)	90 (0.4)
Site #13	262	9	5	74	74 (n/a)	n/a (n/a)
Site #14	137	23	11	61	54 (2.2)	68 (1.7)
Site #15	64	18	9	75	n/a (n/a)	78 (n/a)
Site #16	321	16	6	81	79 (1.0)	82 (0.8)
Site #17	211	28	14	68	67 (1.8)	68 (2.0)
Site #18	28	90	19	56	50 (2.1)	67 (2.1)
Site #15	305	19	19	66	67 (1.8)	65 (1.7)
Site #20	239	26	9	77	73 (1.5)	81 (1.2)
Total	8,322	16	8	73	72 (1.4)	73 (1.3) *

[1] Means for raw index scores at AFA of standard and enhanced groups are reported in parentheses.
* Denotes mean scores that were significantly different ($p < 0.05$).

Table 8. Minutes of Exposure Time (IDUs)

		Minutes of Exposure Time				
Site	Intervention Method	0 - 40	41 - 60	61 - 160	161+	Total
Site #1	Standard	298	0	0	0	298
	Enhanced	0	0	55	1[illegible]4	229
	Total	298	0	55	174	527
Site #2	Standard	0	183	0	0	183
	Enhanced	0	71	25	166	262
	Total	0	254	25	166	445
Site #3	Standard	0	104	[illegible]	16	124
	Enhanced	0	198	35	156	389
	Total	0	302	39	172	513
Site #4	Standard	147	132	0	0	279
	Enhanced	[illegible]	0	258	0	259
	Total	148	132	258	0	538
Site #5	Standard	0	0	185	[illegible]	186
	Enhanced	0	0	35	183	2[illegible]8
	Total	0	0	220	184	404
Site #6	Standard	25	255	0	0	280
	Enhanced	0	0	1[illegible]5	108	233
	Total	25	255	125	108	513
Site #7	Standard	276	0	0	0	246
	Enhanced	71	0	189	0	260
	Total	317	0	189	0	506
Site #8	Standard	0	1[illegible]4	0	0	198
	Enhanced	39	0	0	192	231
	Total	39	198	0	192	429
Site #9	Standard	276	36	22	5	339
	Enhanced	0	0	245	99	344
	Total	276	36	267	104	683
Total	Standard	992	908	211	22	2,133
	Enhanced	111	269	967	1,078	2,425
	Total	1,103	1,177	1,178	1,100	4,558

Table 9. Hierarchical Stepwise Regression for Nine-Site Total Sample (N = 4,569 IDUs)

	IDU Frequency				Needle Risk Index				Sex Risk Index			
Variable	**r**	**Beta**	**R^2**	**cR^2**	**r**	**Beta**	**R^2**	**cR^2**	**r**	**Beta**	**R^2**	**cR^2**
Background												
Age	-0.00	—			-0.02	—			-0.07**	-0.02		
Female	-0.00	—			-0.02	0.01			-0.28**	0.13**		
Black	-0.28**	-0.11**			-0.08**	-0.16**			-0.08**	—		
Hispanic	-0.08**	0.10**			0.10**	—			-0.03*	—		
White	0.04*	—			-0.08**	—			0.13**	0.07**		
HS grad.	-0.08**	-0.02			-0.07**	-0.03*			-0.04*	—		
Unemployed	0.06**	0.03*			0.07**	0.04**			0.06**	0.02		
Ever jailed	-0.08**	—			-0.08**	0.04**			-0.03*	-0.08**		
Previous treatment	0.14**	0.08**			0.09**	0.05**			0.02	—		
Heroin	-0.08**	-0.08**			0.12**	-0.16**			0.02	—		
Cocaine	-0.08**	-0.08**			-0.11**	-0.08**			0.01	—		
Heroin & cocaine	0.24**	0.08**			0.12**	0.24**			-0.02	—		
Years of IDU	0.10**	0.05**			0.06**	—			-0.08**	—		
Number of sex partners	-0.00	—	0.21**	0.21**	-0.01	—	0.10**	0.10**	0.06**	-0.01	0.22**	0.08**
NADR Intervention												
Exposure time	-0.15**	-0.08**	-0.08**	0.01**	-0.15**	-0.09**	0.11**	0.11**	-0.04*	-0.09**	0.08**	0.00
Treatment post-AIA												
Months in treatment	-0.00	-0.12**	0.23**	0.01**	-0.00	-0.08**	0.12**	-0.08**	-0.01	-0.03	0.08**	0.00
Baseline Index												
Measures at AIA	0.49**	0.33**	0.27**	0.05**	0.32**	0.27**	0.10**	0.07**	0.44**	0.33**	0.22**	0.14**

Note: All predictors significant in each block ($p < 0.05$) are included, and standardized Beta weights are based on the final equation. ("cR^2" refers to changes in R^2.)
* $p < 0.05$.
** $p < 0.01$.

Table 10. Hierarchical Stepwise Regression for Nine-Site Predominant Heroin User Sample (N = 1,181 IDUs)

	IDU Frequency				Needle Risk Index				Sex Risk Index			
Variable	r	Beta	R^2	cR^2	r	Beta	R^2	cR^2	r	Beta	R^2	cR^2
Background												
Age	-0.02	—			-0.06*	—			-0.12**	—		
Female	-0.00	—			-0.03	—			0.32**	0.13**		
Black	-0.21**	-0.18**			-0.26**	-0.08**			-0.14**	-0.08**		
Hispanic	20.0**	0.07*			0.19**	0.06*			-0.03	—		
White	0.01	—			0.06*	—			0.17**	0.05		
HS grad.	-0.08*	—			-0.08*	—			-0.02	—		
Unemployed	0.05	—			0.05	—			0.11**	0.05		
Ever jailed	0.04	—			0.07*	0.05			-0.02	—		
Previous treatment	0.10**	0.12**			0.07*	—			0.06*	—		
Years of IDU	0.05	—			0.00	—			-0.07*	—		
Number of sex partners	0.00	—	0.06**	0.06**	-0.05	—	0.08**	0.08**	0.15**	0.06*	0.14**	0.14**
NADR Intervention												
Exposure time	0.09**	-0.09**	0.08**	0.02**	-0.16**	-0.08*	0.09**	0.01**	-0.04	-0.04	0.14**	0.00
Treatment post-AIA												
Months in treatment	-0.20**	-0.22**	0.13**	0.05**	-0.14**	-0.17**	0.12**	0.03**	-0.01	-0.05	0.15**	0.01**
Baseline Index												
Measures at AIA	NA	NA	NA	NA	0.34**	0.32**	0.21**	0.09**	0.53**	0.45**	0.31**	0.16**

Note: All predictors significant in each block ($p < 0.05$) are included, and standardized Beta weights are based on the final equation. ("cR^2" refers to change in R^2.)
* $p < 0.05$.
** $p < 0.01$.

Table 11. Hierarchical Stepwise Regression for Nine-Site Predominant Cocaine User Sample (N = 1,115 IDUs)

	IDU Frequency				Needle Risk Index				Sex Risk Index			
Variable	**r**	**Beta**	**R^2**	**cR^2**	**r**	**Beta**	**R^2**	**cR^2**	**r**	**Beta**	**R^2**	**cR^2**
Background												
Age	0.06*	—			0.03	—			-0.05	—		
Female	-0.03	—			-0.09**	—			0.22**	0.14**		
Black	-0.10**	—			-0.08*	-0.07*			-0.06	—		
Hispanic	0.13**	0.14**			0.07*	-0.06			-0.02	—		
White	0.02	—			0.05	—			0.12**	0.07*		
HS grad.	-0.04	—			-0.02	—			-0.02	—		
Unemployed	0.05	—			0.05	0.04			0.06*	—		
Ever jailed	0.01	—			0.06*	—			-0.01	—		
Previous treatment	0.09**	0.14**			0.07*	0.07*			0.02	—		
Years of IDU	0.13**	—			0.07*	—			-0.06*	—		
Number of sex partners	-0.04	—	0.03**	0.03**	-0.03	—	0.02**	0.02**	0.01	—	0.06**	0.06**
NADR Intervention												
Exposure time	-0.09**	-0.06*	0.04**	0.01**	-0.10**	-0.09**	0.03**	0.01**	-0.03	-0.02	0.06**	0.00
Treatment post-AIA												
Months in treatment	-0.02	-0.03	0.04**	0.00	0.01	-0.02**	0.03**	0.00	-0.05	-0.05	0.06**	0.00
Baseline Index												
Measures at AIA	NA	NA	NA	NA	0.29**	0.28**	0.11**	0.06**	0.38**	0.36**	0.17**	0.11**

Note: All predictor significant in each block ($p < 0.05$) are included, and standardized Beta weights are based on the final equation. ("cR^2" refers to changes in R^2.)
*$p < 0.05$.
**$p < 0.01$.

Table 12. Hierarchical Stepwise Regression for Nine-Site Predominant Heroin and Cocaine User Sample (N = 1,524 IDUs)

	IDU Frequency				Needle Risk Index				Sex Risk Index			
Variable	**r**	**Beta**	**R^2**	**cR^2**	**r**	**Beta**	**R^2**	**cR^2**	**r**	**Beta**	**R^2**	**cR^2**
Background												
Age	-0.06*	—			-0.04	—			-0.04	—		
Female	0.00	—			-0.02	—			0.21**	0.13**		
Black	-0.28**	-0.26**			-0.21**	-0.22**			-0.01	—		
Hispanic	0.24**	—			0.15**	—			-0.06*	—		
White	0.08**	—			0.10**	—			0.09**	0.05		
HS grad.	-0.10**	-0.06*			-0.07**	—			-0.04	—		
Unemployed	0.03	—			0.09**	0.07**			0.06*	—		
Ever jailed	0.02	—			0.07*	0.06*			0.09**	0.08**		
Previous treatment	0.10**	0.09**			0.04	—			-0.00	—		
Years of IDU	0.01	—			-0.00	—			-0.03	—		
Number of sex partners	0.05*	—	0.09**	0.09**	0.00	—	0.06**	0.06**	0.09**	—	0.06**	0.06**
NADR Intervention												
Exposure time	-0.03	-0.08**	0.10**	0.01**	-0.12**	-0.09**	0.07**	0.01**	-0.03	-0.06*	0.06**	0.00
Treatment post-AIA												
Months in treatment	-0.00	-0.05*	0.10**	0.00	-0.02	-0.04	0.07**	0.00	-0.00	-0.03	0.06**	0.00
Baseline Index												
Measures at AIA	NA	NA	NA	NA	0.30**	0.29**	0.16**	0.09**	0.41**	0.38**	0.19**	0.13**

Note: All predictors significant in each block ($p < 0.05$) are included, and standardized Beta weights are based on the final equation. ("cR^2" refers to changes in R^2.)

* $p < 0.05$.

** $p < 0.01$.

Table 13. Intervention Components (IDUs)
(Expressed in Percent)

	Total	Site #							
Component	(N = 3,886)	1	2	3	3	5	8	7	8
Give bleach	82	33	100	100	100	100	35	100	100
Demonstrate bleach use	61	33	100	100	51	44	34	37	100
Practice bleach use	61	33	100	100	49	44	34	37	100
Give condom	91	100	100	100	100	100	34	100	100
Demonstrate condom use	61	33	100	100	51	44	34	37	100
Practice condom use	61	33	100	100	48	44	34	37	100
Video/slide presentation	67	44	100	100	73	100	34	34	54
One-on-one session	72	100	—	100	100	—	100	100	45
Group session (not specific)	10	43	—	—	—	—	34	—	—
Group session: problem solving	26	30	—	41	—	46	45	—	54
Group session: risk avoidance	29	33	—	41	—	100	23	—	54
Group session: negotiation	24	—	100	35	—	46	—	—	54
Role-playing: problem solving	24	—	38	35	24	—	45	—	54
Role-playing: risk avoidance	22	—	43	—	48	46	—	—	54
Role-playing: negotiation	23	—	35	35	24	46	—	—	54
Didactic session: risk avoidance	18	—	100	37	100	100	100	100	54
Booklet/brochure	50	—	100	100	100	—	—	100	100
Referral (HIV or non-HIV)	49	—	100	100	100	—	—	37	54
Quiz	4	—	—	7	24	—	—	—	—

Table 14. Intervention Components: Composite Variables (IDUs)
(Expressed in Percent)

	Total	Site #							
Component	(N = 3,886)	1	2	3	4	5	6	7	8
Times gave bleach/condom									
0	8	—	—	—	—	—	66	—	—
1 - 2	50	68	62	63	—	59	34	33	100
3 - 4	24	32	5	—	73	10	—	54	—
5+	17	—	33	33	23	35	—	10	—
Number of demonstration/ practice events									
0	32	67	—	—	—	56	66	63	—
1 - 2	7	—	—	—	53	—	—	—	—
3 - 4	50	33	65	63	47	44	34	25	100
5+	10	—	35	37	—	—	—	12	—
Number of group events									
0	55	68	—	59	100	—	55	100	46
1 - 2	23	13	100	54	—	55	23	—	—
3 - 4	14	3	—	—	—	10	22	—	54
5+	8	—	—	34	—	35	—	—	—
Number of role-play events									
0	67	100	67	65	52	65	55	100	46
1 - 2	13	—	8	35	—	10	45	—	—
3 - 4	16	—	1	—	48	35	—	—	54
5+	4	—	34	—	—	—	—	—	—

Table 15. Composite Variable Means, by Success Groups (IDUs)

Group	Given Bleach/Condom	Number of Demo/Practice Events	Number of Group Events	Number of Role-play Events
IDU frequency index				
Not successful	2.59	2.80	1.22	1.09
Successful	2.85**	3.47**	1.67**	1.13
Needle risk				
Not successful	2.71	2.80	1.18	1.10
Successful	2.76	3.31**	1.58**	1.10
Sex risk				
Not successful	2.98	3.33	1.41	1.19
Successful	2.66	3.11	1.51	1.11

Table 16. Sociodemographics by NADR Site (Female Sex Partners)

(Expressed in Percent - except where otherwise noted)

NADR Site	N	Age (Mean)	Black	Hispanic	White	HS Graduate	Unemployed	Ever in Jail	Ever in Drug Treatment	Sex for Drugs	Sex for Money
1	162	30.0	96	1	3	42	58	53	12	8	20
2	76	31.4	83	—	10	54	24	46	26	5	12
3	99	31.7	83	10	1	52	42	36	20	8	16
4	171	31.3	57	30	13	67	48	59	21	6	18
5	69	31.7	83	20	—	44	83	51	48	21	12
6	No data	—	—	—	—	—	—	—	—	—	—
7	215	30.5	17	74	3	32	48	39	7	1	4
8	44	33.9	86	2	3	39	40	43	27	1	12
9	28	31.4	57	14	29	61	50	57	7	8	11
10	24	31.4	83	1	8	42	48	29	48	25	42
11	16	32.7	83	20	4	67	67	20	21	7	13
12	35	32.7	96	11	3	49	60	34	29	11	11
13	32	32.1	28	63	3	38	28	25	16	0	3
14	16	32.2	6	—	37	75	31	56	19	0	13
15	4	28.8	96	28	25	75	100	25	50	0	50
16	39	31.6	85	10	3	38	51	39	39	5	21
17	No data	—	—	—	—	—	—	—	—	—	—
18	1	40.0	75	—	20	25	25	100	25	25	50
19	60	29.9	45	2	35	55	50	50	37	8	22
20	34	32.2	21	32	24	41	67	71	27	6	18
Total	1,127	31.2	62	25	11	45	51	45	21	7	16

Table 17. Sociodemographics by NADR Site (Male Sex Partners)

(Expressed in Percent - except where otherwise noted)

NADR Site	N	Age (Mean)	Black	Hispanic	White	HS Graduate	Unemployed	Ever in Jail	Ever in Drug Treatment	Sex for Drugs	Sex for Money
1	35	37	66	23	11	47	43	77	23	11	11
2	85	38	12	8	—	60	18	82	26	[illegible]	7
3	100	35	50	2	2	52	39	73	26	19	18
4	No data	—	—	—	—	—	—	—	—	---	—
5	25	36	50	18	—	52	72	72	48	24	24
6	No data	—	—	—	—	—	—	—	—	—	—
7	6	37	—	83	17	83	33	83	87	50	0
8	29	37	83	3	14	52	52	71	24	10	10
9	18	44	58	56	35	56	18	94	6	50	6
10	8	35	88	12	—	83	50	50	50	12	6
11	2	35	100	—	—	83	0	100	50	50	6
12	2	36	100	—	—	100	100	100	50	0	0
13	48	34	54	41	2	50	18	50	22	9	2
14	83	32	30	59	33	64	24	72	33	21	12
15	5	29	40	100	—	40	20	40	20	0	0
16	9	42	67	11	2	44	44	87	58	11	11
17	No data	—	—	—	—	—	—	—	—	—	7
18	5	33	80	20	—	80	100	80	40	20	20
19	12	35	12	17	—	50	33	92	87	0	0
20	24	33	12	33	17	41	54	75	42	11	13
Total	510	35	75	11	9	53	37	74	29	13	18

Table 18. Initial-to-Followup Changes in Risk Behavior (Female Sex Partners)
(Expressed in Percent)

		Two or More Sex Partners		Two or More IDU Sex Partners		Always Use Condoms	
NADR Site	N	AIA	AFA	AIA	AFA	AIA	AFA
1	162	42	38	17	11	4	26
2	76	54	40	9	8	4	14
3	99	47	37	18	7	7	26
4	171	32	27	12	9	4	25
5	69	65	51	35	12	4	31
6	No data	—	—	—	—	—	—
7	215	30	21	7	4	3	12
8	44	34	25	11	9	5	8
9	28	21	25	11	7	4	12
10	24	67	58	33	12	17	9
11	15	27	33	7	7	20	25
12	35	49	31	11	3	3	35
13	32	19	9	6	3	3	19
14	16	69	50	31	25	19	19
15	4	75	50	0	50	25	25
16	39	36	21	23	8	5	25
17	No data	—	—	—	—	—	—
18	4	100	50	50	0	25	25
19	60	62	38	23	12	3	14
20	34	44	27	15	3	9	13
Total	1,127	42	32	15	8	5	20

Table 19. Initial-to-Followup Changes in Risk Behavior (Male Sex Partners)
(Expressed in Percent)

		Two or More Sex Partners		Two or More IDU Sex Partners		Always Use Condoms	
NADR Site	N	AIA	AFA	AIA	AFA	AIA	AFA
1	35	71	63	47	35	0	25
2	85	66	57	26	22	12	20
3	168	80	52	40	6	10	30
4	—	—	—	—	—	—	—
5	25	92	56	64	14	16	39
6	—	—	—	—	—	—	—
7	8	67	33	58	83	0	17
8	29	76	59	59	21	7	24
9	85	61	39	28	11	0	12
10	8	75	50	75	13	12	12
11	8	100	0	0	0	0	50
12	2	50	50	0	0	0	0
13	48	65	43	24	17	13	29
14	33	64	51	42	22	9	13
15	5	60	40	0	0	20	25
16	9	44	11	0	0	11	22
17	—	—	—	—	—	—	—
18	5	80	40	20	20	20	68
19	12	42	17	17	0	0	10
20	24	79	58	38	21	4	9
Total	510	72	51	37	15	9	24

Table 20. Sample Size, by Intervention Group (Sex Partners)

NADR Site	Standard		Enhanced		
	Females	Males	Females	Males	Total
4	18	25	70	11	197
2	36	46	18	39	197
8	29	46	70	120	265
4	102	2	69	—	171
5	37	11	32	14	94
6	—	—	—	—	9
4	—	4	37	2	221
8	26	15	15	13	73
9	13	6	15	12	46
10	90	2	15	—	32
14	—	—	15	—	17
18	35	2	2	—	37
13	—	—	32	46	78
14	10	15	6	11	49
15	—	—	4	5	9
15	14	—	25	7	9
17	—	—	—	—	—
18	—	3	3	—	9
15	23	—	37	12	78
9	18	13	15	11	9
Total	522	196	605	314	1,637

Table 21. Summary of Results for Sex Risk Index (Sex Partners)

		Total Sample at High Risk			Percent Success and Mean Index Scores by Intervention Group[1]	
NADR Sites	*N*	AIA	AFA	Percent Success	Standard	Enhanced
Site #1	197	31	9	90	88 (1.9)	90 (1.8)
Site #2	161	24	11	83	88 (1.7)	89 (1.6)
Site #3	265	24	9	93	92 (1.0)	94 (1.9)
Site #4	171	32	13	90	87 (2.3)	84 (1.9)
Site #5	94	16	9	90	87 (1.6)	93 (1.2)
Site #6	No data	—	—	—	—	—
Site #4	221	33	16	83	81 (2.6)	84 (2.7)
Site #8	79	16	16	90	93 (1.7)	87 (2.5)
Site #9	46	24	—	79	93 (1.7)	89 (2.2)
Site #10	32	31	12	87	91 (1.6)	86 (1.7)
Site #14	17	23	—	94	—	94 (1.3)
Site #12	37	19	16	84	84 (2.2)	—
Site #13	79	33	13	90	—	85 (1.6)
Site #14	46	26	19	79	86 (2.5)	70 (3.0)
Site #15	9	11	0	100	—	100 (0.8)
Site #16	19	35	—	91	94 (1.6)	90 (1.8)
Site #14	No data	—	9	—	—	—
Site #18	9	33	—	100	100 (0.3)	100 (1.4)
Site #19	72	47	17	83	84 (1.8)	83 (1.9)
Site #20	58	38	17	83	81 (1.9)	85 (1.4)
Total	1,637	30	11	88	87 (1.9)	88 (1.7)

[1] Means for raw index scores of standard and enhanced groups are reported in parentheses.

Table 22. Hierarchical Stepwise Regression for Sex Risk Index
(N = 892 Sex Partners)

Background	Beta	R^2	cR^2
HS graduate	0.04		
Ever trade money for sex	0.04		
Ever in jail	0.04		
Age	0.03		
Ever in drug treatment	0.03		
White	-0.04		
Number of sex partners	0.04		
Ever trade drugs for sex	0.06		
Hispanic	0.04		
Unemployed	-0.08*		
Female	-0.17**		
Black	-0.20**	0.05	
NADR intervention: intervention group	0.02	0.05	0.00
Baseline index	0.22**	0.09	0.04

*$p < 0.05$.
**$p < 0.01$.

Table 23. AIDS Information Sheet Items: IDUs AIA/AFA Percent Correct Responses

AIDS Questions	Total (N = 8,485)	Male (6,286)	Female (2,199)	Black (3,880)	Hispanic (2,776)	White (1,618)	Native American (179)
1. If a person is positive on the blood test for the AIDS virus, that means the person has AIDS.	45.6/65.8	45.1/65.3	46.9/67.1	41.6/60.2	45.6/67.8	55.4/76.5	43.8/60.7
2. Anyone having sex with only one other person cannot get the AIDS virus.	81.1/86.2	79.6/85.7	85.3/87.9	83.1/88.6	73.5/79.8	89.0/92.8	83.6/85.0
3. Using a latex condom is thought to be an effective way to keep from getting the AIDS virus during sex.	85.2/92.1	85.2/92.1	85.2/92.3	86.4/91.6	82.3/92.0	87.8/93.8	84.7/89.7
4. A person cannot get the AIDS virus from works/rigs bought on the street in a sealed wrapper.	57.8/68.4	57.4/67.9	59.0/69.9	57.4/68.9	57.2/64.8	59.8/74.5	58.2/62.6
5. A person cannot get the AIDS virus by shaking hands or touching someone who has AIDS.	77.7/82.6	77.4/82.3	78.7/83.5	81.0/84.9	67.5/75.4	86.9/90.6	82.5/83.2
6. A person can get the AIDS virus from donating blood or plasma.	48.9/53.8	49.0/53.5	48.4/54.5	48.5/56.2	40.9/43.4	61.8/67.5	61.6/59.8
7. A woman with the AIDS virus can give her unborn child AIDS.	97.3/98.1	97.2/98.1	97.6/98.2	97.6/97.9	96.7/97.8	97.4/99.0	97.2/100
8. Cleaning works/rigs with just water is enough to kill the AIDS virus.	95.2/97.1	95.0/96.9	96.7/97.8	95.0/96.7	94.3/97.0	97.2/98.3	94.9/96.3
9. A person can get the AIDS virus from eating in a restaurant where the cook has AIDS.	76.1/82.9	75.1/81.8	79.1/86.3	77.4/83.9	71.3/78.6	81.3/88.6	75.7/87.9
10. Cleaning works/rigs with bleach is thought to be an effective way of killing the AIDS virus.	83.0/95.3	83.5/95.4	81.5/95.1	81.6/94.1	81.1/95.9	89.5/97.6	81.9/93.5
11. A person can avoid getting the AIDS virus by just having oral sex.	81.2/86.1	80.4/85.8	83.5/86.9	83.8/89.0	74.1/80.8	87.3/89.2	80.1/86.0
12. A person can get the AIDS virus by using public toilets.	84.3/89.6	83.7/89.0	85.9/91.3	85.8/91.3	78.5/85.0	89.8/93.7	89.9/94.4
13. A person can get the AIDS virus from having sex with a man who has had sex with other men.	95.8/96.8	96.0/97.1	95.3/96.0	95.2/96.5	96.5/97.6	96.7/96.3	93.2/95.3
14. A person can get the AIDS virus from having unprotected sex with someone who has AIDS.	57.8/68.4	98.7/99.5	98.7/99.2	98.6/99.3	98.9/99.6	98.9/99.3	98.3/99.1
15. A person can get the AIDS virus from sharing dirty works/rigs with someone who has AIDS.	99.2/99.7	99.1/99.8	99.4/99.7	99.1/99.8	99.4/99.6	99.2/99.7	98.9/100
16. A person can get the AIDS virus from sharing works/rigs with someone who has shared them with others.	98.8/99.2	99.1/99.8	98.7/99.2	98.6/99.3	98.9/99.1	99.1/99.3	98.9/100

Table 24. AIDS Information Sheet Items: Sex Partners AIA/AFA Percent Correct Responses

AIDS Questions	Total (N = 1,637)	Male (510)	Female (1,127)	Black (1,075)	Hispanic (336)	White (169)	Native American (50)
1. If a person is positive on the blood test for the AIDS virus, that means the person has AIDS.	39.6/55.2	37.2/52.2	40.6/56.5	33.6/51.9	50.0/59.8	54.4/67.5	48.0/54.0
2. Anyone having sex with only one other person cannot get the AIDS virus.	84.2/89.7	79.6/88.6	86.3/90.2	84.0/89.4	81.1/89.0	92.9/92.3	80.0/92.0
3. Using a latex condom is thought to be an effective way to keep from getting the AIDS virus during sex.	82.3/91.1	82.5/90.2	82.2/91.5	80.8/90.7	85.9/92.8	85.8/93.5	80.0/84.0
4. A person cannot get the AIDS virus from works/rigs bought on the street in a sealed wrapper.	65.9/70.7	62.1/68.4	67.6/71.7	63.7/69.1	70.1/72.3	68.6/77.4	78.0/72.0
5. A person cannot get the AIDS virus by shaking hands or touching someone who has AIDS.	81.8/87.1	80.6/84.3	82.4/88.4	80.9/86.7	79.6/85.7	92.9/95.3	84.0/78.0
6. A person can get the AIDS virus from donating blood or plasma.	53.0/59.7	53.8/57.5	52.5/60.7	49.6/57.6	56.6/58.3	65.1/74.4	52.0/64.0
7. A woman with the AIDS virus can give her unborn child AIDS.	97.4/98.3	97.8/98.2	97.1/98.4	97.7/98.4	96.1/97.9	98.2/98.8	98.0/100
8. Cleaning works/rigs with just water is enough to kill the AIDS virus.	93.7/96.7	93.7/96.9	93.7/96.6	93.5/97.3	94.6/94.6	91.7/97.6	98.0/94.0
9. A person can get the AIDS virus from eating in a restaurant where the cook has AIDS.	75.8/86.0	76.0/83.5	75.7/87.2	75.3/84.8	76.0/87.5	78.1/89.3	74.0/90.0
10. Cleaning works/rigs with bleach is thought to be an effective way of killing the AIDS virus.	64.6/91.2	66.4/91.0	63.7/91.3	61.1/89.8	71.6/92.2	73.4/98.2	62.0/88.0
11. A person can avoid getting the AIDS virus by just having oral sex.	83.6/90.1	82.5/89.2	84.1/90.5	85.0/91.1	78.7/85.7	87.0/94.7	76.0/86.0
12. A person can get the AIDS virus by using public toilets.	83.7/92.4	83.7/91.2	83.7/92.9	83.0/91.0	82.0/92.8	88.2/98.8	92.0/96.0
13. A person can get the AIDS virus from having sex with a man who has had sex with other men.	95.0/96.6	94.3/97.1	95.3/96.4	95.3/96.1	95.8/97.3	90.5/97.0	96.0/100
14. A person can get the AIDS virus from having unprotected sex with someone who has AIDS.	98.3/99.1	97.6/98.8	98.5/99.4	98.4/99.0	97.6/98.8	99.4/100	100/100
15. A person can get the AIDS virus from sharing dirty works/rigs with someone who has AIDS.	97.9/99.6	98.8/99.2	97.5/99.7	98.6/99.6	95.8/99.1	97.0/100	100/100
16. A person can get the AIDS virus from sharing works/rigs with someone who has shared them with others.	98.3/99.3	98.4/99.2	98.3/99.4	98.5/99.3	97.0/99.4	99.4/99.4	100/100

Table 25. AIDS-Related Knowledge, by Gender and Race
(Mean Number of Correct Responses)

		Gender			Race				
Scale	AIA/AFA	Male	Female	p	Black	Hispanic	White	Native American	p
IDUs: **(N = 8,485)**									
Sexual risk subscale	AIA	4.40	4.48	**	4.47	4.25	4.60	4.33	**
	AFA	4.60	4.62	ns	4.65	4.50	4.71	4.55	**
Needle risk subscale	AIA	4.34	4.34	ns	4.32	4.31	4.45	4.33	**
	AFA	4.59	4.62	ns	4.59	4.56	4.69	4.52	**
General risk subscale	AIA	4.27	4.36	**	4.32	4.00	4.73	4.50	**
	AFA	4.70	4.81	**	4.74	4.48	5.16	4.29	**
Total score	AIA	13.00	13.18	**	13.09	12.56	13.75	13.22	**
	AFA	13.89	14.04	**	13.97	13.54	14.56	13.93	**
Sexual partners: **(N = 1,637)**									
Sexual risk subscale	AIA	4.37	4.43	*	4.74	4.39	4.59	4.32	ns
	AFA	4.63	4.84	ns	4.66	4.64	4.73	4.62	ns
Needle risk subscale	AIA	4.19	4.31	ns	4.15	4.29	4.30	4.38	**
	AFA	4.55	4.59	ns	4.66	4.58	4.73	4.54	**
General risk subscale	AIA	4.30	4.30	ns	4.21	4.41	4.77	4.55	**
	AFA	4.67	4.84	**	4.71	4.83	5.23	4.82	**
Total score	AIA	12.84	12.99	ns	12.78	13.07	13.63	13.16	**
	AFA	13.89	14.11	**	13.92	14.05	14.72	13.98	**

* $p < 0.05$.
** $p < 0.01$.

Table 26. AIDS Knowledge Comparison of IDU Sample to Sex Partner Sample
(Mean Number of Correct Responses)

Scale	AIA/AFA	IDU Sample	Sex Partner Sample	p
Sexual risk subscale	AIA	4.22	4.43	ns
	AFA	4.60	4.67	**
Needle risk subscale	AIA	4.34	4.20	**
	AFA	4.59	5.58	ns
General risk subscale	AIA	4.30	4.31	ns
	AFA	4.73	4.79	*
Total score	AIA	13.05	12.94	ns
	AFA	13.93	14.03	*

* $p < 0.05$.
** $p < 0.01$.

Table 27. Hierarchical Stepwise Regression Predicting AIDS Knowledge
(N = 10,122)

	Total Score			Sex Risk Subscale			Needle Risk Subscale			General Risk Subscale		
Variable	Beta	R^2	cR^2	Beta	R^2	cR^2	Beta	R^2	cR^2	Beta	R^2	cR^2
HS graduate	0.12**			0.09**			0.05**			0.11**		
Black	-0.06			0.04			0.01			-0.06		
White	0.10**			0.07*			0.08**			0.08**		
Hispanic	-0.08*			-0.04			0.01			-0.12**		
Ever in jail	0.04**			0.03*			0.02			0.04**		
Age	0.00			0.01			0.02			-0.02		
Female	0.05**	0.05		0.03**	0.02		0.02*	0.01		0.05**	0.04	
Group: IDU	-0.01	0.05	0.00	-0.03*	0.02	0.00	0.01	0.01	0.00	-0.01	0.04	0.00
NADR intervention: enhanced group	0.01	0.05	0.00	-0.01	0.02	0.00	0.02	0.01	0.00	0.02	0.04	0.00
Baseline score	0.36**	0.17	0.12	0.21**	0.07	0.05	0.10**	0.02	0.01	0.37**	0.17	0.13

* $p < 0.05$.

** $p < 0.01$.

Table 28. Comparison of IDUs and Sex Partners Followed/Not Followed

	IDUs (N = 33,407)		Sex Partners (N = 6,216)	
Variable	**Followed (N = 13,788)**	**Not Followed (N = 19,619)**	**Followed (N = 2,445)**	**Not Followed (N = 3,771)**
Sex Risk Index (mean)	2.61	2.91**	5.36	5.40^{ns}
AIDS knowledge (mean)	13.02	13.21**	12.89	12.82^{ns}
Needle Risk Index (mean)	3.66	3.66^{ns}	n/a	n/a
IV Drug Frequency Index (mean)	4.41	4.18**	n/a	n/a
IV drug use (mean years)	14.26	13.34**	n/a	n/a
Age (mean)	34.11	35.11**	32.2	31.4**
% male	73.9	77.4**	36.7	43.1**
% Black	53.2	49.6**	71.0	59.0**
% White	19.1	26.9**	11.2	17.8**
% Hispanic	26.1	20.5**	14.9	16.9*
% high school graduate	44.9	46.2*	48.8	50.8^{ns}
% ever in jail	82.1	81.8^{ns}	56.6	54.6^{ns}
% ever in drug treatment	58.7	56.9**	28.5	29.4^{ns}
% homeless	12.0	17.3**	14.4	18.8**
% employed	17.0	17.9^{ns}	20.7	22.1^{ns}
% ever had STD	37.7	35.8**	38.9	36.9*

* $p < 0.05$.

** $p < 0.01$.

Table 29. Stepwise Discriminant Analysis Predicting Followup

IDUs (N = 29,973)			Sex Partners (N = 6,142)		
Step		F to Enter	Step		F to Enter
1	Not White	270.74	1	Black	95.35
2	Not homeless	148.62	2	Not homeless	29.29
3	IV drug frequency (-)	100.36	3	Female	22.35
4	Younger age	77.28	4	Not Hispanic	14.99
5	Female	56.93	5	Older age	15.47
6	Hispanic	52.17	6	AIDS-related knowledge	6.07
7	Black	51.94	7	Less than high school graduate	7.50
8	AIDS-related knowledge (-)	38.10	6	Ever in jail	4.50
9	Less sex risk	36.62	5	Not White	3.57
10	Ever diagnosed with STD	19.56	10	Ever diagnosed with STD	1.36
11	Greater needle risk	7.96	11	Less likely to have ever been in drug treatment	1.47
12	Previous drug treatment	2.85			

Percent of "grouped" cases correctly classified: 56.2%.

Percent of "grouped" cases correctly classified: 56.7%.

Table 30. Selected Variables by Month of AIA for IDUs
(*N* = *33,407)*

AIA Month	N	Mean Age	IDU Freq. Index	Needle Risk Index	Sex Risk Index	AIDS Knowledge	Percent Black	Percent White	Percent Hispanic	Percent Female
1	461	34.9	4.4	3.6	3.1	12.7	56	18	23	23
2	623	34.8	4.3	3.7	3.0	12.2	58	21	22	25
1	915	34.6	4.3	3.7	3.4	12.6	54	27	18	19
4	608	3.8	4.2	4.4	3.3	12.7	69	23	21	20
6	585	4.3	4.4	3.4	3.4	13.1	54	23	22	20
6	479	32.9	3.9	3.7	3.0	13.1	59	25	19	19
7	624	34.2	4.2	3.8	3.1	13.2	49	34	18	21
8	617	34.3	4.4	3.7	2.6	13.1	69	24	18	19
8	442	35.3	4.3	3.7	2.6	13.0	67	24	18	19
10	545	34.8	4.3	3.9	3.0	13.1	59	27	13	18
11	633	35.4	4.3	3.6	2.7	13.2	75	17	7	21
12	1,511	35.7	4.3	3.7	2.6	13.0	69	17	18	25
13	1,857	35.5	4.3	3.7	2.9	13.0	62	18	18	25
10	1,569	35.2	4.2	3.5	2.9	13.0	58	20	20	25
15	1,578	34.7	4.4	3.7	2.9	13.4	50	24	24	25
16	1,437	34.7	4.3	3.7	2.6	13.2	56	20	20	25
17	1,343	34.8	4.3	3.7	2.6	13.1	52	22	22	25
15	1,392	34.6	4.2	3.7	2.8	13.1	56	27	21	24
16	1,059	34.2	4.3	3.7	2.8	13.2	55	23	20	25
20	1,306	34.8	4.2	3.7	2.7	13.1	51	24	22	21
21	1,307	33.7	4.3	3.6	2.6	13.1	18	25	29	25
22	1,627	34.2	4.4	3.5	2.6	13.1	47	22	29	23
23	1,400	34.8	4.3	3.5	2.8	13.1	46	25	26	20
27	1,464	34.8	4.5	3.5	2.6	13.2	40	22	35	21
25	1,175	34.8	4.4	3.5	2.6	13.1	40	24	35	25
26	1,174	34.4	4.5	3.5	2.6	13.4	43	23	30	26
27	1,126	34.4	4.1	3.6	2.9	13.4	40	29	21	26
26	987	34.1	4.3	3.5	2.7	13.4	41	29	21	29
29	1,094	34.6	4.3	3.7	2.6	13.4	46	24	27	25
30	878	34.2	4.2	3.5	2.6	13.3	42	25	29	22
31	577	34.1	4.1	3.4	2.8	13.6	42	32	20	20
32	434	32.9	3.9	3.2	2.6	13.3	37	36	21	27
33	265	33.1	3.9	3.0	2.4	14.0	28	47	18	23
34	134	33.0	3.5	4.2	4.2	14.4	16	64	11	22
35	181	33.6	3.7	3.8	3.4	14.1	29	54	13	30

Table 31. Selected Variables by Month of AIA for Sex Partners
(*N* = 6,216)

AIA Month	N	Mean Age	Sex Risk Index	AIDS Knowledge	Percent Black	Percent White	Percent Hispanic	Percent Female
1	44	32.3	4.9	11.6	71	11	18	55
2	88	33.5	5.6	12.0	49	7	17	60
3	109	30.9	5.6	12.1	63	14	21	51
4	193	30.5	5.3	12.1	94	16	24	55
5	174	32.0	5.7	12.1	63	14	22	63
6	142	30.7	5.6	12.2	68	6	25	82
7	104	31.4	5.2	12.6	61	13	24	68
8	94	31.0	5.3	12.9	78	7	19	71
9	61	31.7	5.4	12.9	82	12	7	57
10	57	31.8	5.4	12.9	77	17	5	54
11	123	31.8	5.6	13.1	58	11	9	49
12	246	31.6	4.9	12.6	82	14	9	49
13	344	32.2	5.6	12.9	48	9	12	59
14	284	32.6	5.4	13.0	77	11	17	59
15	212	31.0	5.5	12.6	68	16	16	67
16	231	31.4	5.5	13.0	13	15	9	63
11	193	31.7	5.4	13.6	70	14	22	60
18	299	32.1	5.0	12.7	11	11	5	52
19	337	31.6	4.7	12.6	78	11	9	44
20	236	32.1	5.5	13.1	59	16	14	54
24	246	30.8	5.2	13.2	14	24	13	44
22	238	31.8	5.8	13.1	56	21	16	64
23	59	30.8	5.6	13.1	11	24	22	66
24	199	32.0	5.3	13.2	54	9	23	66
25	225	32.9	5.2	12.9	48	16	25	64
26	56	31.8	5.7	13.0	49	16	26	64
27	241	32.3	5.4	13.2	59	70	22	66
28	193	32.3	5.5	12.9	59	16	14	69
29	246	31.6	5.2	13.2	58	15	21	67
30	242	31.4	4.9	12.9	64	13	17	64
31	123	32.3	4.6	13.0	50	13	12	66
32	157	32.1	5.0	12.9	58	11	14	67
33	82	31.8	4.6	13.6	13	24	14	69
34	90	29.5	5.5	13.1	34	20	44	91
35	56	31.2	5.8	13.7	32	32	27	75
36	15	36.4	7.5	13.0	40	33	20	87

Table 32. Somers' d (Asymmetric) for Time of AIA

	IDUs Three-Month Groups		Sex Partners Three-Month Groups	
Variable	d	t	d	t
Dependent variables: (potential history effect)				
AIA NOVA sex risk	-0.03	-8.3	-0.02	-2.3
AIDS knowledge quiz	0.07	18.5	0.08	8.1
AIA NOVA needle risk	-0.05	-12.8	n/a	n/a
IBR IV drug index	0.001	0.3	n/a	n/a
Dependent variables: (potential sampling bias effect)				
Age	-0.02	-4.3	0.007	0.7
Length of IV drug use	-0.02	-4.3	n/a	n/a
Gender (male)	-0.01	-5.0	-0.04	-4.6
Black	-0.09	-26.5	0.03	-11.9
White	0.03	10.0	0.03	6.7
Hispanic	0.05	17.1	0.03	4.4
Education level	-0.01	-3.6	0.009	0.7
Ever in jail	-0.01	-4.6	-0.004	-0.5
Ever in drug treatment	-0.003	-0.8	-0.006	0.8
Primary drug				
Cocaine	-0.07	-23.9	n/a	n/a
Heroin	0.05	18.5	n/a	n/a
Speedball	0.009	5.9	n/a	n/a

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